RADio COMmunication

April 1983

Commencing in this issue

A MODERN HF TRANSCEIVER by G. N. FARE, G3OGQ

Front view of the transceiver and power unit

Journal of the Radio Society of Great Britain

ANNEE MONDIALE DES COMMUNICATIONS
WORLD COMMUNICATIONS YEAR
AÑO MUNDIAL DE LAS COMUNICACIONES
1983

RSGB

The Amcomm Hotline.

Call 01-422 9585 3 Lines now for fast delivery!

Access

BARCLAYCARD VISA

ICOM 290E
2 mtr. all mode tcvr.
Phone for Price.

YAESU FT1 Gen. Cov. Tcvr. Call now for ex stock fast delivery.

YAESU FT102 9 Band Tcvr. Call before 2pm for price and you'll have it next day.

YAESU FT290R/ FT790R. Waiting for you with free Nicads and Charger

ICOM 720A Gen. Cov. Tcvr. Call us and we'll put a smile on your face.

THE NEW YAESU FT980 TRANSCEIVER

Can you afford to buy anything else! Write or call 01-422 9585 (3 lines) for price, specification and leaflet.

ICOM 730 8 Band Tcvr.
Leading H.F. Mobile. Call 01-422 9585 for quote

YAESU FRG7700.
Still with free antenna tuner – call fast – we'll deliver fast.

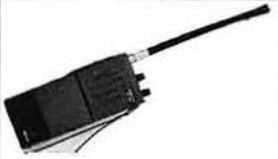
ICOM IC-R70 Rcvr.
Call us and we'll deliver free and include an antenna coupler.

YAESU FT480R All mode 2m tcvr. YAESU's big success. Call us now to make it yours.

ICOM 251E 2 mtr all mode base. We can't get enough – call now and try us for price and delivery.

ICOM 740 WARC Tcvr.
A host of features at a real competitive price – call now.

TONO 7000E/9000E.
We just need your call and it's on the way.



ICOM Twins IC4E/1C2E
Both ex stock. Call us now.

YAESU's Handheld Twin FT708 and FT208

E&OE

Access

BARCLAYCARD VISA

AMCOMM

OPPOSITE SOUTH HARROW TUBE STATION ON THE PICCADILLY LINE

Amcomm Services,
194, Northolt Road, South Harrow,
Middlesex HA0 2EN.
Telephone: 01-422 9585 (3 lines)
Telex: 24263

We also stock:
DATONG, JAYBEAM, HYGAIN, MICROWAVE MODULES, TONO AMPS, TELEREADER, RSGB Publications. HOKUSHIN, G. WHIP, TET, TOKYO H.P. LABS and many more.
ROTORS: CDE, KENPRO, HIRSCHMANN SKYKING ETC.

SHOWROOM OPENING HOURS
TUE-FRI 10.00am–6.00pm CONTINUOUS
SAT. 9.00am–5.00pm CONTINUOUS

ASK FOR DETAILS OF OUR INTEREST FREE AND LOW DEPOSIT H.P.

APRIL 1983

VOLUME 59 No 4

RADio COMmunication

CONTENTS

EDITOR
A. W. Hutchinson

Assistant editor
Mrs S. M. Newton

Draughtsman
D. E. Cole

Editorial secretary
Mrs O. M. Ogles

Contributions **(including Members' ads)** and all correspondence concerning the **content** of *Radio Communication* should be addressed to:

The Editor, RSGB,
88 Broomfield Road,
Chelmsford,
Essex CM1 1SS

Tel 0245 84938

Office hours: 0900 to 1700

ADVERTISING

Advertisements, other than Members' ads, should be sent to:

M. J. Hawkins, G3ZNI,
RSGB Advertisement Officer,
PO Box 599,
Cobham,
Surrey KT11 2QE

Tel 037 284 3955

EDITORIAL CONSULTANT
J. P. Hawker, G3VA

Correspondence concerning the distribution of the journal and all other Society matters should be addressed to:

RSGB Headquarters,
Alma House,
Cranborne Road,
Potters Bar,
Herts EN6 3JW

Tel 0707 (from London, 77) 59015

Business hours: 1000 to 1600

Technical articles on subjects of amateur interest are always welcome and should be sent to: The Editor, *Radio Communication,* 88 Broomfield Road, Chelmsford, Essex CM1 1SS.

All articles received are reviewed for technical merit by the RSGB Technical & Publications Committee, or an acknowledged expert on the subject, before acceptance. Payment at high competitive rates will be made for all articles published.

The editor will be pleased to send intending authors a manuscript preparation guide and to give any other advice and assistance requested.

Radio Communication **is published by The Radio Society of Great Britain as its official journal on the first Friday of each month and is sent free and post paid to all members of the Society**

ABC MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

31,822 copies per issue average circulation in 1982

Closing date for contributions unless otherwise notified: five weeks before publication date

I have used the TS430S, John has used it, Alan has used it, in fact we have all put the new HF rig from Trio on the air and our unanimous opinion is that with this new rig Trio have pushed the concept of transceiver as we all knew it well into the next generation of equipment. Not only is the rig compact, only slightly larger than the TS130S but along with being a full amateur band transceiver the new TS430S also provides todays discerning operator with a general coverage receiver. Key features of the new rig are two digital VFO's, eight memory channels each of which can be used as a separate VFO, programmable band scan, IF shift, notch filter and the provision for internally fitting an optional FM mode.

Modes of Operation
The TS430S modes of operation are USB, LSB, CW, and AM. FM is available by the addition of the optional FM430 frequency modulation unit. Mode selection is easily accomplished by front panel switches with adjacent LED indicators.

General Coverage
In addition to the amateur bands from 160 to 10 metres (including the new frequency allocations) the TS430S features a 150kHz to 30MHz general coverage receiver. Front panel UP/DOWN switches allow easy selection of the desired amateur band. A MHz step switch provides 1MHz band steps across the entire range of the transceiver and each of the two digital VFO's is completely tunable from 150kHz to 30MHz.

Two VFOs
The two digital VFO's operate independently of each other tuning in 10Hz steps, a STEP switch is provided, use of which increases the tuning step to 100Hz. An A=B switch is provided to enable the operator to quickly put both VFO's on the same frequency, ideal for checking on the source of QRM without losing the original operating frequency. A lock switch guards against accidental frequency shift. RIT is provided which operates on both VFO's and memory channels alike.

Memory Operation
Each memory stores frequency, mode and band information, the eighth memory holds receive and transmit frequencies independently so giving simple split frequency operation. A front panel VFO-MEMO switch allows each of the memory channels to be used either as a VFO or as a fixed channel. An internal lithium battery gives complete memory and VFO back-up independent of the external supply to the transceiver. The TS430S also has Memory scan, the transceiver scanning only the channels in which a frequency has been stored. Not only does the memory hold frequency but the mode also, most useful if a mix of broadcast frequencies has the odd SSB net frequency within it. The hold time for each occupied channel is approximately 2 seconds, a hold switch is provided to interrupt the scanning process.

Band Scan
A programmable band scan is available, the limits of scan being set by memory channels 6 and 7. Again the hold switch will cancel the scan function.

IF Shift
IF shift enhances listening on today's busy bands.

Notch Filter
A tunable notch filter is included to give best interference rejection.
A front panel NAR/WIDE switch allows narrow-wide IF filter selection when the optional filters are installed. In the SSB mode, with the optional YK-88SN (1·8kHz) filter installed, either 2·4kHz wide, or 1·8kHz narrow may be selected. In the CW mode, with the optional YK88C (500Hz) or the YK88CN (270Hz) filter installed 2·4kHz wide or 500Hz or 270Hz narrow may be selected. In the AM mode, with the optional YK88A (6kHz) filter installed, 6kHz wide or 2·4kHz narrow may be selected. In the FM mode, with the optional FM430 unit installed, a single 15kHz bandwidth is provided.

Filters
A front panel switch activates the speech processor circuit, with its audio compression circuit, and change in ALC time constant, resulting in a marked improvement in intelligibility, accompanied by a substantial increase in "talk power."

Speech Processor
The TS430S runs 200 watts input on SSB/CW on 160-15 metres; 180 watts on 12-10 metres. In the AM mode, it runs 80 watts on all bands and in the FM mode with the optional FM-430 unit fitted the rig runs 100 watts input, again on all bands. The TS430S operates from 12 volts DC, or from 240 volts AC by means of an optional AC power supply.

Other Important Features
All mode squelch circuit.
Includes a 20dB FR attenuator.
A transverter socket is included on the rear panel.

Now from Trio, the R2000 general coverage receiver. By taking all the superb features of the R1000 and combining them with the latest in microprocessor control Trio have, in one step, completely revised the standard by which short wave receivers are judged. Among the many features provided for the discerning listener are programmable scan, memory scan, memory retention of the mode set for a particular frequency and last, but not least, Trio have included an FM mode – why FM after all this time and our repeated comment that for a shortwave broadcast receiver FM is not really necessary. Take a look at the rear panel of the R2000: a socket marked VHF converter. Wouldn't it be superb if Trio produced a VHF converter covering from 118 to 174MHz – then you would require FM, you would also require AM. Study the features and I am sure you will agree the Trio R2000 is the receiver for you.

Continuous Coverage from 150kHz to 30MHz
Front panel up/down band switches allow easy selection within the full coverage of the receiver. The VFO is continually tunable throughout the full 150kHz-30MHz range.

All Modes SSB, CW AM and FM

Ten Memories Store Frequency, Band and Mode Data
Each of the ten memories can be tuned by the VFO, thus operating as ten built in digital VFOs. The original memory frequency can be recalled by simply pressing the appropriate memory channel key. All information on frequency, band, and *mode* is stored in the selected memory.
The "auto M" switch allows two types of memory storage: when the "auto M" switch is off, data is memorized by pressing the "M in" switch; when the "auto M" switch is on the frequency being used at that time is automatically memorized.

Memory Scan
Scans all memory channels or may be user programmed to scan specific channels. Frequency, band and mode are automatically selected in accordance with the memory channel being scanned.

Programmable Band Scan
Scans automatically within the programmed bandwidth. Memory channels 9 and 0 establish the scan limit frequencies. The hold switch interrupts the scanning process. However, the frequency may be adjusted using the tuning knob whilst in the scan hold position.

Clock Display with Integral Timer

Three Built In Filters with Narrow/Wide Selector
In the AM mode 6kHz wide or 2·7kHz narrow may be selected. In the SSB mode 2·7kHz is automatically selected. In the CW mode 2·7kHz is again chosen and if the optional YG455C filter is installed then 500Hz in the narrow position. In the FM mode 15kHz bandwidth is automatically selected.

Other important features are: squelch on all modes, noise blanker, a large 4 inch front mounted speaker, tone control, RF attenuator, AGC switch, high and low impedance antenna terminals, 13·8 V DC operation, record jack and, of course, provision for a VHF converter. All in all, a truly remarkable receiver.

£398.92 inc VAT carriage £5.00

"memorable"
the new receiver from Trio.

APPROVED TRIO DEALER

BIRMINGHAM
Ward Electronics
Soho House
362-364 Soho Rd
Birmingham B21 9OL
021 554 0708

BUCKINGHAMSHIRE
Photo Acoustics Ltd
58 High St
Newport Pagnell
Bucks. 0908 610625

EAST SCOTLAND
Jaycee Electronics
20 Woodside Way
Glenrothes
Fife KY7 5DE. 0592 756962

ESSEX
Waters & Stanton Electronics
Warren House
18-20 Main Rd
Hockley, Essex. 0702 206835

LANCASHIRE
Stephens-James Ltd
47 Warrington Rd
Leigh
0942 676790

NORTH LONDON
Radio Shack Ltd
188 Broadhurst Gardens
London NW6 3AY
01 624 7174

WEST MIDLANDS
Dewsbury Electronics
176 Lower High Street
Stourbridge
0384 390063

WALES
MRS Communications Ltd
Imperial House
95 Penarth Road
Cardiff CF1 7JT
0222 24167/8

W. SUSSEX
Bredhurst Electronics
High St, Handcross
Haywards Heath
W. Sussex 0444 400786

YORKSHIRE
Leeds Amateur Radio
27 Cookridge St
Leeds LS2 3AG
0532 452657

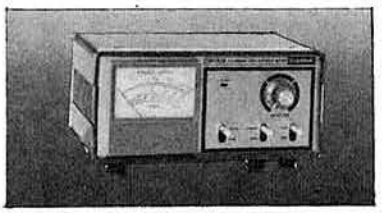
NORTHERN IRELAND
George Moore Electronics
7 Cyprus Avenue
Belfast BT5
Belfast 647570

TRIO

As the appointed distributors for Trio, we recommend that you purchase your Trio equipment from an approved stockist (list above). Any stockist *not* on the list has no connection with the Trio UK sales and service organisation and cannot, despite claims to the contrary, offer any meaningful guarantee of backup service on Trio equipment.

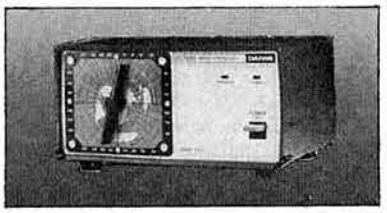
we recommend the DAIWA range.

		Price inc. VAT	Carr.
VHF AMATEUR RECEIVERS			
SR9	2m FM tunable/xtal receiver 144-146MHz	46.00	1.50
SR1000	2m synthesised VHF monitor receiver. Requires no crystals for full amateur band coverage 144-146MHz	72.50	2.25
POWER & SWR METERS			
CN520	1-8 60MHz mini cross needle power/SWR meter	36.50	1.50
CN540	50-150MHz mini cross needle power/SWR meter	39.50	1.50
CN550	144-250MHz mini cross needle power/SWR meter	39.50	1.50
CN620A	1-8-150MHz cross pointer power and SWR meter. Up to 1kW	57.00	1.50
CN630	140-450MHz cross pointer power and SWR meter. Up to 200W	85.00	1.50
CN650	1-2-2-5GHz cross pointer power and SWR meter. Up to 20W	114.00	1.50
CNW419	1-8-30MHz 200W gen. cov tuning unit	130.00	5.00
CNW919	2M power meter and antenna tuning unit	92.00	2.25
CNA1001A	Fully automatic all band ATU. Includes cross pointer power meter	156.00	5.00
CNA2002	As for CNA1001A but 2kW rating for tuner and power meter	228.00	5.00
ANTENNA ACCESSORIES			
CS201/TW2	Two way 50 ohm coax switch. 0-500MHz	13.95	1.00
CS401	Four way 50ohm coaxial switch 0-500MHz	43.50	2.00
ROTATORS			
DR7500X	For HF 3 element beams. Preset controller. 6 core cable	113.72	5.00
DR7500R	As for DR7500X but using the DAIWA round controller	125.00	5.00
DR7600X	Heavy duty. Will take up to 2 element 40m beam. Preset control	163.49	5.00



DR7600R	As for DR7600X but using the DAIWA round controller	176.29	5.00
KS065	Deluxe bearing for fixing stays to rotating mast	19.50	2.00
POWER SUPPLIES			
PS200D	Heavy duty power supply 9-15v 20 amps. Fully metered	118.00	5.00
PS300	Daiwa heavy duty PSU 30A max 22A continuous	135.00	5.00
PSR1250	Daiwa 50A max	338.00	5.00

INFRA-RED MICROPHONE			
RM940	New mobile mic with no connections between mic and rig	45.00	1.50
S9	Spare sensor for RM940 mic system	6.50	0.50
M9	Extra mic for RM940 system	13.00	1.50
F4	Set of four windshields for RM940 mic. Available singly at 75p	3.00	0.50



new from lirpa electronics

the **FIM 1**

We were particularly pleased to see the first samples of a new product from Lirpa Electronics recently. Their new station accessory is designed to be used in all stations both amateur and commercial, and in our opinion will be an invaluable aid in clearing up some of our bands. Based on a recent, almost accidental discovery, the F.I.M.1 uses a series of digital delay lines to produce signal delay adjustable from 2-5 seconds. The new feature of the system is the reverse connection of the delay lines so that when connected between a microphone and transmitter, the operator can monitor what is going to go out on the air before the words have actually been formed. This device will, therefore, prevent all those foolish remarks like, "my SWR is better than 1 to 1", and, "my power meter shows that my pair of 6146B's are producing in excess of 400W pep", from actually going out on the air. Just think of it, no longer will we have to listen to rubbish, either on 80m or 2m. No longer will operators be heard saying, "I could build a better rig than the FT one if I really tried". All in all, a significant step forward for amateur radio and one that we should all welcome. **See the all-new F.I.M.1 at your dealers soon.**

The only drawback at the moment is that the F.I.M.1 will only work when the system SWR is very low, preferably 1:1. We have come up with a way to improve your SWR to suit the F.I.M.1 as follows:

This month's tip If you want a quick way to improve your SWR readings using the popular twin meter bridges, just remove the outer case and connect a 1 ohm 1% resistor across the reflected power meter. The value of the resistor is quite critical, and of course it must be of 1% tolerance for maximum accuracy. On reassembly of the meter you will find your SWR readings dramatically better and this will enable you to concentrate on more important matters such as determining how many angels can be assembled on the point of a pin.

PRICE AVAILABLE ON APPLICATION

a receiver for the discerning few, the **NRD 515**

As a person not owning the receiver, you may ask what sets this particular one above all others. This is difficult to define – the feel of the equipment when wandering over the crowded band, its signal handling capability and selectivity can only really be appreciated by use. Technically, the equipment is above reproach. JRC's manufacture and production control methods as applied to other items in the range are equally applied to their amateur products. The other items I refer to, only a small part of the vast range, are marine radio equipment, Marisat mobile terminals, Omega navigators, doppler sonar, echorsounder/fish finders, communication satellite earth stations and a complete range of avionic beacons, radar and associated products. Indeed, a wide range application of electronic and radio technology for land, sea and air.

You may be forgiven for associating such advanced technology with complexity of operation, a piece of equipment that needs an operator with an electronics degree. However, the assumption is incorrect. The NRD is easy to use with the minimum of controls to ensure the operator really enjoys his listening time. Digital readout, MHz, mode and filter bandwidth switches together with a VFO knob that will tune the band continuously without using any other control, from 10 KHz to 30 MHz or vice versa. To assist with difficult band conditions the NRD515 has pass band tuning and the medium wave broadcast section from 600 KHz to 1·6 MHz has a preselector control to cope with the crowded conditions. Add the optional 600 Hz CW filter and the 96 channel memory unit and, as other NRD515 owners would say, "a joy to own".

OBITER DICTA

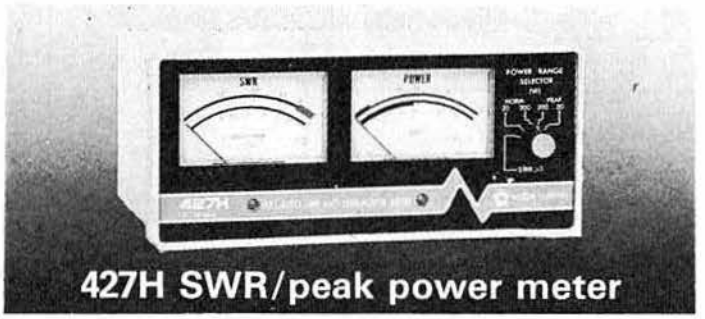
Good morning

Another Emporium News, sorry, **obiter dicta.**

Well, I'm writing this edition on the **Birmingham New Street to Glasgow Express.** Yes, you've guessed it, I've had enough of the **pressures** of the Matlock Head Office and have decided to spend a day with **Sim** in the relative calm of **the Glasgow Shop.** Very **pleased** we are with the **response** to our venture in Scotland. The Scottish amateurs are supporting the venture and **making it all worthwhile.** Sim is still telling me of the new faces he is seeing in the shop and some of them are still meeting him with the words, **"good heavens, I've only just found out we have a Lowe Electronics Shop in Glasgow".** Perhaps I have not done enough to publicise the venture but would you **please** assist me; tell your friends about the Scottish Emporium and its stock of equipment and accessories **for you, the discerning amateur.**

The same goes for our **London Shop.** Don't forget to take your QSL card along. **Andy** and **Tony** display visitors' cards in the shop and their welcome is most **warm and sincere.**

The Lowe Electronics shop for the **North East of England, including Cumbria,** is now firmly based in Darlington. I write this at the beginning of February—I hope to have all things **complete** in Darlington **by mid-April** and to judge from the comments I am hearing from my friends in the



427H SWR/peak power meter

North East, the opening is being awaited with some anticipation. Having lived in Matlock most of my life I know not the problems of being unable to get those small bits and pieces which are so essential. **Our aim in the opening of the Lowe Electronic Shops is to satisfy this need.** Although we do sell rigs we pride ourselves on a complete range of essentials.

The train has just crossed the border. Small world isn't it—met a fellow **radio amateur** on the train from Derby to Crewe. Handed him the **Trio TR2500** which I always carry with me on these trips and he then gave his travelling companions a short lecture on amateur radio. A pleasant surprise. I didn't recognise him at first **as he had grown a beard** since I last saw him but we renewed our acquaintance over the TR2500. A superb rig and very pleasant to pocket as one travels about the Kingdom. Listened to the **Anglo-Scottish repeater, GB3AS** as we left Penrith and copied it for many miles north of Carlisle. Incidentally, for you train buffs, myself included and Roy and David in the Matlock Shop, **Jubilee Class "Leander"** and **Class 4P Johnson Midland Compound "Number 1000"** were in the siding to the south of Carlisle station—very cold they looked.

I must break off now and make sure I am on the Glasgow section of the train as it parts at **Carstairs** and part of the train goes to Edinburgh. Still, I suppose we could always open a **Lowe Electronic's Shop in Edinburgh** . . . Good, I am definitely on the Glasgow train. On our way again. Just heard a snippet of a contact with a station in Glasgow, very sensitive this TR2500. I wish I'd brought **the matching TR3500 as well.**

Back in stock is an old favourite, **the KX2,** but now much improved and named **the KX3.** An essential piece of hardware to improve the performance of your shortwave station. **The KX3** is priced at **£42.50,** carriage £2.25.

New from Trio is a neat accessory called the **RA3.** You all know the RA1 helical whip for the Trio TR2300. Makes portable operation a pleasure, well now **Trio** have produced **a 3/8 wave telescopic antenna** for the **TR2500.** The aerial is equipped with a clip for your top pocket and is just the thing to have on your person when you need a bit more gain. Ideal for the rig and when you see it you will appreciate the trouble Trio take with both rigs and accessories. What about the **MJ86,** the **MJ84** and the **MJ46,** 8 to 6, 8 to 4 and 4 to 6 pin respectively **microphone adapters.** Each priced at £4.83, including VAT, carriage 50p these little items enable you to use your favourite mike with any of your rigs. Until things become stable with the advent of the **36 pin mike plug** the Trio adapters would seem to be an essential item in anyone's shack.

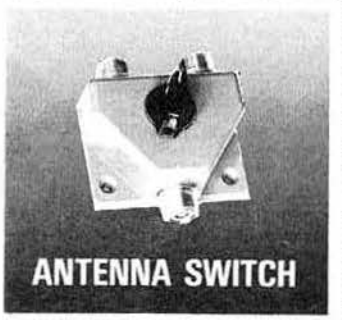
Almost in Glasgow now. Two cups of coffee, a visit by the ticket inspector **and a British Rail ham and tomato sandwich**—nothing but the best for a Lowe Electronics' executive travelling the country—and I am ready for the rigours of Glasgow. I like Glasgow, especially **the Holiday Inn jacuzzi pool** frequented by the International Airline Hostesses. Not on this trip, however, back today to Matlock to make sure my wife has completed her list of tasks. Asked David in the shop if he could check up on how she was doing but it appears he is too busy supervising his own good lady.


AF-606K

"British Steel Plates—Clydebridge Works" outside the carriage window so I'll temporarily close. More on the return journey. . . .

Well the train's packed, a coach or two short. But the chicken soup is fine and so is the sole, beans and mashed potato. The British Rail catering is, as usual, very good but I have had enough of the cramped conditions and lack of understanding of the people who put these trains together and omit coaches. If someone high in the British Rail hierarchy reads this then please telephone me and reassure me that Jimmy Saville was actually travelling on a real train!

I digress. **What a superb rig is the TR7930.** Whilst in the Glasgow Shop a customer asked if he should change his TR7800 for one. I showed him the TR7930—immediately he was impressed. **The green readout** was, he thought, a vast improvement on his TR7800 but when I showed him the additional memory channels, 21 in all, the option of omitting a particular memory channel, or several of them, **he was speechless.** What about a transceiver which, when you step up the band automatically assumes the correct Simplex or Repeater shift dependent on the frequency. 145.500 is obviously a "S" Simplex frequency, 145.700 is again a "-" frequency. Of course if you wanted to be opposite and be Simplex on Repeater channels and vice versa you can. Reverse repeater and a scan function that looks for either a clear or busy channel are also part of this new FM mobile rig. **25 watts** and the well-known **Trio audio on both transmit and receive** and you have a 2 metre transceiver which has no equal. Visit a Lowe Electronics' Shop and see what I mean. The train is still packed, people sitting in the corridors, the unfortunate standing. **Talking about the TR7800,** we still have several left her at Matlock. If you want one ring us for a special price. Please note stocks are limited and as I have said many times before, he who hesitates is lost. **The R2000 has surprised even me!** I knew that shortwave listening was catching on but sales of this rig have exceeded our expectations. Those who have a **R2000 general coverage receiver** are now, as I am speeding back to Matlock in this crowded train, sat in the comfort of their own homes, in front of **a welcoming fire,** the wind whistling in the dipole outside, listening to the world going about its business—stations being received from far off countries whilst in the kitchen their wife is making them a **hot chocolate drink.**


ANTENNA SWITCH

Anyway, first the **bad news.** Traci, complete with her bright red toenails has left, returned home. Now, the **good news,** in her place we have **Beryl.** How can I describe Beryl? Dare I tell you about **her passion** for bicycle riding, **those trim thighs** with just a gleam of perspiration, **those pale blue shorts** and **perfect calves,** those flashing pedals. Sorry lads, Beryl's bicycle is a tandem which she shares with her husband but if you ever see the tandem padlocked to the lamp-post in our car park then be warned.

That's about it for now, as I have just heard a rumour that **Jimmy Saville** has got on the train and I want to go and see what sort of accommodation he has. So until next time, Gud DXes 73es FBYLS, XYLs, esFBOM, etc.

David.

ICS

ADVANCED MICROPROCESSOR CONTROLLED AMATEUR RADIO ACCESSORIES. HIGH PERFORMANCE VHF ANTENNAS.

AMT-1

AMTOR/RTTY/ASCII/CW TERMINAL UNIT

Turns an SSB transceiver plus an ASCII Terminal or Personal Computer into a professional quality, error correcting data transmission system. An excellent 16 LED 'Frequency Analyser' tuning display plus full status indication make it easy to operate. Over 400 amateur radio/computer enthusiasts who are now on AMTOR world wide are waiting to welcome you to the mode.

12V DC operation **£275.00** (£3.50 P & P & Insurance)

See Feb '83 *Radio Communication* for more details

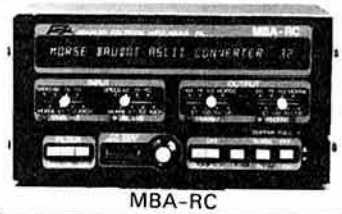

KT-2 CK-2 MM-2

A.E.A. MICROPROCESSOR CONTROLLED MORSE KEYERS: The Ultimate Keyer Range

MODES:	Ten Memories	Auto Contest Ser. No.	Trainer	'Bug'	Calibrated beacon	Message Repeat	
MM-2	●	●	●	●	●		£129. (£2.50 p&p)
CK-2	●	●		●		●	£113. (£2.50 p&p)
KT-2			●	●			£96. (£2.00 p&p)

12V DC operation

Send for further details.


MBA-RC

RTTY/ASCII/CW CODE CONVERTER/ TERMINAL UNIT

RTTY/ASCII/CW Terminal unit with inbuilt code conversion between any two modes at any standard data rates. Parallel, serial and morse key inputs and outputs plus current loop, Centronics printer drivers. 32 Column vacuum fluorescent display is built in. Excellent tuning indicator. The ultimate in versatility.

12V DC operation **£415.00** (£3.50 P & P & Insurance)


MBA-RO

RTTY/ASCII/CW READER

Simply plugs into the speaker output of your receiver and allows copy of amateurs, news agencies etc. on RTTY. 170Hz and 425Hz shifts are switchable, as are all common Baud rates. Also reads clearly sent CW to 100 w.p.m. CW speed is self tracking. Built in 32 character vacuum fluorescent display. No separate monitor needed.

12V DC operation **£198.00** (2.50 P & P & Insurance)

WOODPECKER BLANKER

WB-1C

Connects in the antenna lead of your transceiver and attenuates 'Woodpecker' pulses by typically 45-50dB. Incorporates adjustable drop out time, carrier operated relay. Switchable for both 10 and 16Hz Woodpecker transmission modes. Variable blanking pulse width. No modifications to your equipment, and the most effective woodpecker blanker that we are aware of.

12V DC operation **£126.00**
(£2.50 P & P & Insurance)


BT-1

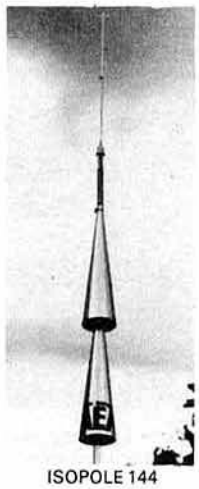
MORSE TRAINER

Each new character is introduced separately until familiarity is reached. Then new characters are mixed 50% with previous characters learned.

Groups go from 2 to 3 to 4 then 5 letters. All characters are sent at 20 w.p.m. with three second gaps between groups. Incorporates key input and speaker for sending practice.

For the serious student, it is possible to reach 20 w.p.m. in one month with no previous experience.

12V DC input **£65.00** (£2.00 P & P & Insurance)


ISOPOLE 144

A.E.A. ISOPOLE™ 2M AND 70cm VERTICAL ANTENNAS

These antennas simply put your signal where you want it—on the horizon. Most other VHF verticals radiate at 10-15° above the horizontal, but the Isopole's unique (aesthetically pleasing) decoupling cones stop *any* feeder radiation and ensure a proper 0° radiation pattern.

All users report dramatic improvement over previous, similar sized, antennas they have used. One of the hottest selling antennas in the U.S.A.

Isopole 144 **£35.00**
(£2.50 P & P & Insurance)

Isopole 440 **£59.00**
(£2.50 P & P & Insurance)

OTHER ITEMS:

- **VIC-20** games cartridge/cable/keyboard overlay for turnkey terminal operation with AMT-1 **£55** (£1 p+p + insurance)
- **Commodore PET** stand alone split screen AMTOR program on E-PROM with manual **£45** (£1 p+p + insurance)
- **G3PLX MkII AMTOR** board (converts existing RTTY stations to AMTOR) **Price T.B.A.**

All prices include VAT at 15% plus Insurance
We reserve the right to revise prices in accordance with current exchange rates.

Enclose large s.a.e. for details

FULL 12 MONTHS PARTS AND LABOUR WARRANTY

I.C.S. Electronics Limited
PO Box 2
ARUNDEL
West Sussex
Tel: (024 365) 590

AMATEUR ELECTRONICS UK

G3FIK

AUTHORISED YAESU

THE SYMBOL OF TECHNICAL EXCELLENCE

Your number one source for YAESU MUSEN

KEEP AHEAD WITH THE YAESU FT-102!

Better Dynamic Range
The extra high-level receiver front end uses 24 VDC for both RF amplifier and mixer circuits, allowing an extremely wide dynamic range for solid copy of the weak signals even in the weekend crowds. For ultra clear quality on strong signals or noisy bands the high voltage JFET RF amplifier can be simply bypassed via a front panel switch, boosting dynamic range beyond 100dB. A PLL system using six narrow band VCOs provides exceptionally clean local signals on all bands for both transmit and receive.

Total IF Flexibility
An extremely versatile IF Shift/Width system, using a totally unique circuit design, gives an infinite choice of bandwidths between 2.7kHz and 500Hz, which can then be tuned across the signal to the portion that provides the best copy sans QRM, even in a crowded band. A wide variety of crystal filters for fixed IF bandwidths are also available as options for both parallel and cascaded configurations. But that's not all; the 455kHz third IF also allows an extremely effective IF notch tunable across the selected passband to remove interfering carriers, while an independent audio peak filter can also be activated for single-signal CW reception.

New Noise Blanker
The new noise blanker design in the FT-102 enables front panel control of the blanking pulse width, substantially increasing the number of types of noise interference that can be blanked, and vastly improving versatility.

Commercial Quality Transmitter
Introducing to amateur radio design concepts that have previously been restricted to top-of-the-line commercial transmitters; far above and beyond government standards in both freedom from distortion and purity of emissions.

Transmitter Audio Tailoring
The microphone amplifier circuit incorporates a tunable audio network which can be adjusted by the operator to tailor the transmitter response to individual voice characteristics before the signal is applied to the superb internal RF speech processor.

IF Transmit Monitor
An extra product detector allows audio monitoring of the transmitter IF signal, which, along with the dual meters on the front panel, enables precise setting of the speech processor and transmit audio. A new "peak hold" system is incorporated into the ALC metering circuit to further take the guesswork out of transmitter adjustment.

New Purity Standard
Three 6146B final tubes in a specifically configured circuit provide a freedom from IMD products and an overall purity of emission unattainable in two-tube and transistor designs.

New VFO Design
Using a new IC module developed especially for Yaesu, the VFO in the FT-102 exhibits exceptional stability under all operating conditions.

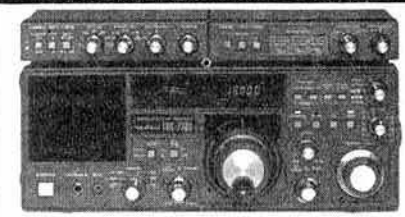
ANCILLARY EQUIPMENT

SP-102 EXTERNAL SPEAKER/AUDIO FILTER
The SP-102 features a large high-fidelity speaker with selectable low- and high-cut audio filters allowing twelve possible response curves. Headphones may also be connected to the SP-102 to take advantage of the filtering feature.

FC-102 1.2 KW ANTENNA COUPLER
1.2KW band-switched L-C pi-network antenna coupler. In-line wattmeter with three ranges (20, 200 and 1200 watts full scale), and "peak hold" system.

FV-102DM SYNTHESIZED, SCANNING EXTERNAL VFO

FRG-7700 High Performance Communications Receiver



YAESU's top of the range receiver. All-mode capability, USB, LSB, CW, AM *and* FM 12 memory channels with back-up. Digital quartz clock feature with timer. Pictured here with matching FRT-7700 Antenna tuner and FRV-7700 VHF converter.

FT-708R/208R Synthesized UHF/VHF Transceivers

NC-7 - Standard charger

NC-8 - Standard/quick charger/DC Power supply

NC-9C - Compact charger (220-234V)

PA-3 - Car adapter

YM-24A - Speaker/microphone

FL-2010 - 10 watt power amplifier for FT-208R

FL-7010 - 10 watt power amplifier for FT-708R

FT-290R/790R 2m & 70cm PORTABLES

10 memories, 2 VFO's, LCD display, C size battery, easy car mounting tray, FT-290R 0.5 low/2.5 high watts out FT-790R 0.2 low/1.0 high watts out (incorporates speech compressor).

FT-230R/730R 2m & 70cm FM MOBILES

- Two independent VFO's
- 10 memories
- Priority function
- Memory and band scan
- 12.5/25KHz steps (25/100KHz FT-730R)
- Large LCD readout.

FT-480R/780R 2m & 70cm MOBILES

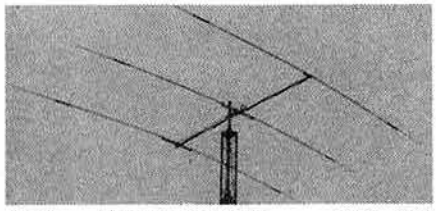
The most advanced 2 metre and 70 cm mobiles available today — USB, LSB, FM, CW full scanning with priority channel, 4 memory channel, dual synthesized VFO system.

FAST MAIL ORDER!!!

BY CREDIT CARD OR CHEQUE

Simply phone or write and leave the rest to us

TET ANTENNA SYSTEMS



AX210N	10 ele. yagi for 2m crossed	74.95	(n/c)
HB10F2T	2 ele. 10m mono band beam	51.50	(n/c)
HB10F3T	3 ele. 10m mono band beam	74.95	(n/c)
HB15F2T	2 ele. 15m mono band beam	60.66	(n/c)
HB15F3T	3 ele. 15m mono band beam	93.46	(n/c)
HB15M25P	VP mini size 15m 2 ele.	69.50	(n/c)
HB15M35P	VP mini size 15m 3 ele.	102.30	(n/c)
HB34D	4 ele. tri band beam 10/15/20m	222.90	(n/c)
HB33SP	3 ele. tri band beam 10/15/20m	192.50	(n/c)
HB35C	Tri band array 10/15/20m	283.95	(n/c)
HB35T	5 ele. 10/15/20m	278.50	(n/c)
MV3BH	Vertical for 10/15/20m	37.99	(n/c)
MV4BH	Vertical for 10/15/20/40m	48.90	(n/c)
MV5BH	Vertical for 10/15/20/40/80m	63.95	(n/c)
MLA4	Loop antenna 10/15/40/80	105.60	(n/c)
SQ22	Phased 2 ele. swiss quad 2m	58.95	(n/c)
SQY06	6 ele. quagi 2m	45.75	(n/c)
SQY08	8 ele. quagi 2m	52.75	(n/c)
HB210S	10 ele. dual driven yagi 2m	47.99	(n/c)
TE214	14 ele. long yagi 2m	74.40	(n/c)
SSL720	9 x 2 ele. (18) slot fed 70cm	77.20	(n/c)
HB23SP	2 ele. tri band beam 10/15/20m	135.60	(n/c)
SSL218	9 x 2 ele. (18) slot fed 2m	144.79	(n/c)
TPH2	Phasing harness 2m	17.25	(n/c)
QYU10	10 ele. quagi 70cm	67.90	(n/c)
SQ007	70cm 2 ele. phased swiss quad	66.99	(n/c)
SQ10	Swiss quad 10m	97.50	(n/c)
SQ15	Swiss quad 15m	106.90	(n/c)

YAESU ANTENNAS

Base			
RSL145GP	½ wave base ant. 2m	21.20	(1.50)
RSL435GP	½ wave co-linear 70cm	31.60	(1.50)
HF Mobile			
RSL3.5	3.5MHz resonator & whip	12.21	(0.50)
RSL7.0	7.0MHz resonator & whip	11.80	(0.50)
RSL14.0	14.0MHz resonator & whip	11.45	(0.50)
RSL21.0	21.0MHz resonator & whip	11.20	(0.50)
RSL28.0	28.0MHz resonator & whip	11.00	(0.50)
RSL2A	Mast to suit above	5.00	(0.50)
RSM2	Gutter mount/Feeder/PL259 suit above	10.94	(0.75)
VHF Mobile			
RSL145	2m ¼ wave fibreglass whip	12.10	(0.50)
RSL145S	2m ¼ wave steel whip foldover	9.25	(0.50)
RSL150SS	2m ¼ wave PL259 shock spring	3.90	(0.50)
RSM2	Gutter mount/Feeder/PL259 (RSL145)	10.94	(0.75)
RSM4M	Heavy duty mag/Feeder/PL259	13.25	(1.00)
UHF Mobile			
RSL453S	½ wave antenna	15.50	(0.50)

ANTIFERENCE ANTENNAS

VHF Mobile			
TAP3009	½ wave 3db snap-in hinged whip	11.42	(3.00)
TAP3677	½ wave 3db snap-in shock coil	15.64	(3.00)
TAP3002	¼ wave unity gain snap-in hinged whip	8.81	(3.00)
UHF Mobile			
TAP3462	½ over ¼ wave 3db	9.89	(3.00)
TAP3697	½ over ¼ wave 5db	18.40	(3.00)
K220	Mag mount/Feeder to suit above	10.73	(2.00)

Antennas Various/Accessories

HQ1	Mini beam 10/15/20m 2 ele. 1kW	TBA	(4.00)
C4	Vertical 10/15/20m	48.50	(3.00)
G4MH	Mini beam 10/15/20	85.00	(4.00)
KTLM-4	Gutter mount/Cable assy. SO239	6.90	(0.50)

DATONG PRODUCTS

PC1	50KHz to 30MHz receive converter	137.42	(0.50)
VLF	Very low freq. converter	29.90	(0.50)
FL1	Frequency agile audio filter	79.35	(0.50)
FL2	Multimode audio filter	89.70	(0.50)
ASP/A	Auto RF speech clipper (YAESU)	82.80	(0.50)
ASP/B	Auto RF speech clipper (TRIO)	89.70	(0.50)
D75	Manual RF speech clipper	56.35	(0.50)
RFC/M	RF speech clipper module	29.90	(0.50)
D70	Morse tutor	56.35	(0.50)
AD270	Active dipole RX ant. (indoor)	47.15	(0.50)
AD370	Active dipole RX ant. (outdoor)	64.40	(0.50)
MK	Morse keyboard	137.42	(0.50)
DC144/28	2m converter	39.67	(0.50)
RFA	Broadband preamplifier	33.92	(0.50)
MPU	Mains power unit	6.90	(0.50)

MICROWAVE MODULES

Transverters

MMT28/144	10m transverter	109.95	(2.50)
MMT70/144	4m transverter	119.95	(2.50)
MMT432/144R	70cm transverter	184.00	(2.50)
MMT1296/144	23cm transverter	184.00	(3.00)
MMT70/28	4m transverter	119.95	(2.50)
MMT144/28	2m transverter	109.95	(2.50)
MMT432/28S	70cm transverter	159.95	(2.50)

Linear Amplifiers

MML28/100S	10m 100W linear amp.	129.95	(3.00)
MML70/50S	4m 50W linear amp.	85.00	(2.50)
MML70/100S	4m 100W linear amp.	139.95	(3.00)
MML144/30LS	2m 30W linear amp. 1-3W in	69.95	(2.50)
MML144/50S	2m 50W linear amp.	85.00	(2.50)
MML144/100LS	2m 100W linear 1-3W in	159.95	(3.00)
MML144/100S	2m 100W linear 10W in	139.95	(3.00)
MML432/50	70cm 50W linear amp.	109.95	(3.00)
MML432/100	70cm 100W linear amp.	228.65	(4.00)
MML1296/10	23cm 10W linear amp.	199.00	(2.50)
MML432/30	70cm 30W linear amp. 1-3W in	99.00	(3.00)

Converters

MM1000KB	ASC11 morse converter with keyboard	99.95	(3.00)
MM4001	RTTY to TV converter	189.00	(2.50)
MM4001KB	RTTY transceiver	269.00	(2.50)
MM4000KB	RTTY transceiver with keyboard	299.00	(4.00)
MMC28/144	10m to 2m converter	29.90	(1.00)
MMC50/28	6m to 10m converter	29.90	(1.00)
MMC70/28	4m to 10m converter	29.90	(1.00)
MMC70/28LO	4m to 10m with LO	32.90	(1.00)
MMC432/28S	70cm to 10m converter	37.90	(1.00)
MMC432/144S	70cm to 2m converter	37.90	(1.00)
MMC435/600	UHF ATV converter	27.90	(1.00)
MMC1296/28	23cm to 10m converter	34.90	(1.00)
MMC1296/144	1296MHz low noise converter	69.95	(1.00)
MMK1691/137.5	1691MHz meteosat converter	129.95	(2.50)

Morse Talkers

MMS1	Morse tutor 2-20WPM Side tone	115.00	(2.50)
MMS2	Morse tutor (advanced) 6-32WPM + speak back	169.00	(2.50)

Amateur TV

MTV435	70cm 20W (PSP) transmitter	149.00	(2.50)
MMC435/600	Converter ATV UHF output	27.90	(1.00)

Preamplifiers

MMA144V	2m preamp RF switched	34.90	(1.00)
MMA28	10m preamp	16.95	(1.00)
MMA1296	23cm preamp	34.90	(1.00)

Frequency Counters

MMD650/500	500MHz digital meter	75.00	(1.00)
MMD600P	600MHz pre scaler	29.90	(1.00)
MMDP-1	Probe	14.90	(0.50)

Filters

MMF144	2m band pass 40W max.	11.90	(1.00)
MMF452	70cm band pass 40W max.	11.90	(1.00)

Various

MMS384	384MHz signal source	29.90	(1.00)
MMR15/10	15db 10W attenuator	11.90	(1.00)

HI-MOUND MORSE KEYS

HK702	Up down keyer marble base	24.50	(0.50)
HK704	Up down keyer	16.68	(0.50)
HK705	Up down keyer	12.50	(0.50)
HK706	Up down keyer	13.75	(0.50)
HK708	Up down keyer	11.96	(0.50)
HK808	Up down keyer marble base	39.57	(0.50)
MK704	Twin paddle keyer	10.95	(0.50)
MK705	Twin paddle keyer marble base	22.00	(0.50)

MOULDINGS

IK	Iambic keyer	19.95	(0.50)

TOKYO HY POWER

HC150	HF ATU SWR/Power meter 200W PEP	62.50	(n/c)
HC2000	HF 2kW ATU SWR/Power meter 6 POS ant. switch. 6 to 1 vernier high Q coils 2kW peak 1kW continuous	276.55	(n/c)

Antenna Rotators & Accessories

9502	Channel master med duty up to 8 ele.	57.00	(3.50)
9523	Alignment bearing for 9502	15.81	(1.25)
KR400	Med/Heavy duty 180° meter (inc. lower casting)	90.85	(3.50)
KR400RC	Med/Heavy duty 360° meter Load 200Kg 1¼"-2" masts	114.94	(3.50)
CASTING	Lower casting set (400RC)	15.00	(1.25)
KR600RC	Heavy duty 360° meter Load 200Kg Rot600Kg/cm Brake 4000Kg/cm 1¼"-2"masts	163.30	(3.50)

Antenna Switches

SA450	SO239 connectors 1 in 2 out	9.75	(0.50)
SA450N	"N" type connectors 1 in 2 out	12.75	(0.50)

Baluns

BL50A	RAK 50 ohm ferrite BALUN 1:1 1.8-38MHz 1kW	12.88	(1.50)
BL-40X	Balun 2K PEP 1.1	11.52	(1.50)

Dummy Loads

T30	30W DC 500MHz PL259	6.61	(0.50)
T100	100W DC 500MHz SO239	20.12	(1.00)
T200	200W DC 500MHz SO239	31.36	(1.50)
T210	Wide band 10W 1.2G-2.4G	24.50	(0.75)
AW05	Pocket RF wattmeter 5W up to 500MHz BNC	19.75	(1.00)

Filters

AKD	Hi-pass blocks 0-200MHz RF interference to UHF above 400MHz	5.50	(0.50)

Linear Amplifiers

YAESU

FL110	HF 160/80/40/20/15/10m 100W (10W drive)	155.25	(n/c)
FL2100Z	HF warc 1200w PEP. SSB 1kW CW, 400W AM/FM/FSK	449.00	(n/c)
FL2010	2m VHF 10W linear	54.00	(n/c)
FL2050	2m VHF 50W linear 10W drive	115.00	(n/c)
FL7010	70cm UHF 10W linear	91.00	(n/c)

TOKYO HY POWER

HL32V	VHF 30W linear 1-5W drive HI-LOW output	53.50	(n/c)
HL82V	VHF linear preamp output meter 2-12W in 35-85+ out	144.50	(n/c)
HL160V	VHF linear preamp output meter 1-10W in 160W+ out	242.40	(n/c)
HL45U	UHF linear preamp 2-15W in 10-45W out	119.75	(n/c)

ADONIS MICROPHONES Mobile/Base

MM202S	Mobile safety mic. (non scanning)	23.00	(1.00)
MM202HD	Mobile safety mic. (scanning)	30.00	(1.00)
AM502	Desk mic. (compressor selectable)	45.94	(1.00)

Miscellaneous

Mutec

SNL144S	2m preamp RF switched	33.90	(1.00)
RPCB	144UB FT221/225 front end board	64.50	(1.25)

Ni-cads

AA	AA size Ni-cad	1.00	(0.20)
C	C size Ni-cad	2.40	(0.30)
NC1850	Ni-cad charger (4 x C or 4 x AA)	9.50	(1.00)

DRAE PRODUCTS

DRAE4	4 amp PSU	30.75	(2.00)
DRAE6	6 amp PSU	48.00	(2.50)
DRAE12	12 amp PSU	74.00	(3.00)
DRAE24	24 amp PSU	105.00	(4.00)
DRAE WM	135-450MHz wavemeter	27.50	(1.00)

"N" Connectors (Silver Plated)

N58	"N" Male connector RG58	2.25	(0.25)
N8	"N" Male connector RG8	2.40	(0.25)
N308	"N" T adaptor (three female)	2.40	(0.25)
N307	"N" L adaptor (1 male 1 female)	2.40	(0.25)
N306	"N" Double female adaptor	1.90	(0.25)
N310	"N" Double male adaptor	2.50	(0.25)
NB304	"N" Female to BNC male adaptor	2.10	(0.25)
N402	"N" Plug to SO239	2.05	(0.25)
N403	"N" Socket to PL259	2.00	(0.25)
N404	"N" Socket to SO239	1.80	(0.25)

Speakers/Headphones

Various

RT650	4 ohm, 8 ohm 3W nom 6W max	6.50	(0.50)
MS60	3W nom 5W max	7.50	(0.50)
S2	Headphones (cobalt magnets)	5.75	(0.50)

YAESU

YH55	Headphones Low Z	10.00	(0.50)
YH77	Lightweight headphones Low Z	10.00	(0.50)

SWR/Power Meters

YAESU

YS200		52.90	(n/c)
YS2000		69.79	(n/c)

Other Makes

RF2000	Twin meter 3.5-150MHz F/Scale 200/2000W	18.25	(1.00)
YM1X	Twin meter 3.5-150MHz F/Scale 12 or 120W	14.99	(1.00)
Sensor 500	1.8-160MHz 5/50/500W	37.08	(1.00)
T430	Twin meter 144-430MHz	34.85	(1.00)
T435	Twin meter 144-435MHz	39.10	(1.00)

Please send your order direct to Dept. MH at our main address below, including carriage charges where applicable and your full delivery address.

Amateur Electronics UK
504-516 Alum Rock Road·Birmingham 8
Telephone: 021-327 1497 or 021-327 6313
Telex:334312 PERLEC G
Opening hours: 9.30 to 5.30 Tues. to Sat. continuous – CLOSED all day Monday.

Carriage charges shown apply to UK mainland only.

All prices include VAT

All prices subject to alteration without notice.

ACCESS · BARCLAYCARD VISA

or attractive H.P. terms readily available for on-the-spot transactions. Full demonstration facilities. Free Securicor delivery.

THANET'S STAR PERFORMERS

Just a few stars to choose from the fabulous galaxy of Amateur Radio Equipment available at Thanet Electronics.

IC-740 £725 inc.

This latest transceiver contains all the most asked-for features, in the most advanced solidstate HF base station on the amateur market...performing to the delight of the most discerning operator.

Study the front panel controls of the ICOM IC-740. You will see that it has all of the functions to give maximum versatility to tailor the receiver and transmitter performance to each individual operator's requirements.

Features of the IC-740 receiver include a very effective variable width and continuously adjustable noise blanker, continuously adjustable speed AGC, adjustable IF shift and variable passband tuning built in. In addition, an adjustable notch filter for maximum receiver performance, along with switchable receiver preamp, and a selection of SSB and CW filters. Squelch on SSB Receive and all mode capability, including optional FM mode. Split frequency operation with two built-in VFO's for the serious DX'er.

The IC-740 allows maximum transmit flexibility with front panel adjustment of VOX gain and VOX delay along with ICOM's unique synthesized three speed tuning system and rock solid stability with electronic frequency lock. Maximum versatility with 2 VFO's built in as standard, plus 9 memories of frequency selection, one per band, including the new WARC bands.

With 10 independent receiver and 6 transmitter front panel adjustments, the IC-740 operator has full control of his station's operating requirements.

See and operate the versatile and full featured IC-740 at your authorized ICOM dealer.

Options include:
- FM Module
- Marker Module
- Electronic Keyer
- 2 - 9MHz IF Filters for CW
- 3 - 455KHz Filters for CW
- Internal AC Power Supply

PSU £119.

Accessories.
- SM5 Desk Microphone
- UP/DWN Microphone
- Linear Amplifier
- Autobandswitching Mobile Antenna
- Headphones
- External Speaker
- Memory Backup Supply
- Automatic Antenna Tuner

IC-R70 £499 inc.

Now that we have tried the R70, we believe that it is going to be a real winner.

The R-70 covers all modes (when the FM option is included), and uses 2 CPU-driven VFO's for split frequency working, and has 3 IF frequencies: 70MHz, 9MHz and 455KHz, and a dynamic range of 100dB.

Other R-70 features include: input switchability through a pre-amplifier, direct or via an attenuator, selectable tuning steps of 1KHz, 100Hz or 10Hz, adjustable IF bandwidth in 3 steps (455KHz). Noise limiter, switchable AGC, tunable notch filter, squelch on all modes, RIT, tone control. Tuning LED for FM (discriminator centre indicator). Recorder output, dimmer control.

The R-70 also has separate antenna sockets for LW-MW with automatic switching, and a large, front mounted loudspeaker with 5.8W output. The frequency stability for the 1st. hour is ± 50Hz, sensitivity- SSB/CW/RTTY better than 0.32 μv for 12dB (S+N)÷N, Am-0.5μv, FM better than 0.32 for 12dB Sinad. DC is optional on the R-70. It has a built-in mains supply.

The IC-R70 measures 286mm x 110mm x 276mm and weighs 7.4Kg., making it a very attractive package indeed. Are you ready for this truly excellent receiver? You must hear it, we know you will be impressed!

Thanet ICOM Thanet ICOM Thanet ICOM Thanet ICOM Thanet ICOM Thanet ICOM

TO THE GALAXY

Can YOU read the many RTTY and CW stations to be heard on the air?

Short wave listeners and amateurs are able to take more interest in other modes of transmission than speech with the new ranges of decoders and senders available. As well as amateur transmissions there is loads of interesting news and other broadcasts which can be read using these space-age devices. As UK importers of the world renowned TONO and TASCO products we can offer you a wide range of devices from a simple morse and RTTY reader which can be plugged into your TV to complete send and receive systems with memories and built-in displays or outputs for a high definition VDU. MR-250 £325. CWR-685E £789, CWR-670 £289, CWR-685E £789 and CWR-610 £189. Please call us for further details or visit us or your dealer for a demonstration.

ICOM produce a perfect trio in the UHF base station range, ranging from 6 Meters through 2 Meters to 70 cms. Unfortunately you are not able to benefit from the 6m product in this country, but you CAN own the IC-251E 2 Meter station and the 451E for 70 cms.

And remember we also sell **Yaesu, Jaybeam, Datong, Welz, G-Whip, Western, TAL, Bearcat, Versatower** and **RSGB** publications from our shop and showroom at the address below.

Come in for a demonstration or just a chat, our qualified sales staff and technicians will be glad to assist you.

Listed below are other sets available from Thanet Electronics, a more detailed specification of these will appear in future advertisements, prices are inclusive of VAT. IC-730 £629, IC-720 £949, IC-2KL + PSU £1149, IC-PS15 £119, IC-ML1 £59, IC-505 £299, IC-SP3 £39, IC-410 £379, IC-AT500 £339, IC490 £429, IC-AT100 £249, IC-551 £369. IC-PS20 £139.

Agents (phone first – all evenings and weekends only, except Scotland)
Scotland – Jack GM8 GEC (031 665 2420) **Midlands** – Tony G8AVH (021 329-2305)
North West – Gordon G3LEQ Knutsford (0565) 4040 Ansafone available

Dealers

Tyrone Amateur Electronics N. Ireland (0662) 2043
Bredhurst Electronics Sussex (0444) 400786
Photo-Acoustics Ltd. Bucks (0908) 610625
S & S Amateur Radio Lancs (07) 744 22239
Alyntronics Tyne & Wear (0632) 761002
Fant horpes Humberside (0482) 223096
Wisbech Amateur Radio (0945) 581 099
LAM Electronics Glos (0242) 43891
Leeds Amateur Radio (0532) 782224
Booth Holdings Avon (02217) 2402
Telecom S Yorks (0226) 5031
Gemini Lancs (0204) 652233
Poole Logic (0202) 683093

Thanet ICOM Thanet ICOM Thanet ICOM Thanet ICOM Thanet ICOM Thanet Electronics
143 Reculver Road, Herne Bay, Kent. Tel: (02273) 63859.
BARCLAYCARD VISA
Same day despatch if possible

DO YOUR MAIL ORDER SHOPPING THE EASY WAY— THE BREDHURST WAY

To order any of the items listed below, simply write enclosing a cheque or phone and quote your credit card number—we'll do the rest!

Bredhurst electronics

WELZ		£	c&p
SP15M	SWR-PWR Meter HF/2M 200W	35.00	(1.00)
SP45M	SWR-PWR Meter 2M/70cm 100W	51.00	(1.00)
SP200	SWR-PWR Meter H.F./2M 1kW	69.95	(1.50)
SP300	SWR-PWR Meter H.F./2M/70cm	97.00	(1.50)
SP400	SWR-PWR Meter 2M/70cm 150W	69.95	(1.50)
SP10X	SWR-PWR Meter H.F./2m compact	24.45	(0.75)
SP380	SWR-PWR Meter H.F./2M/70cm compact	49.00	(1.00)
AC38	A.T.U. 3.5 to 30 MHz 400W PEP	65.00	(1.00)
CT15A	15/50W Dummy Load (PL259)	7.95	(0.75)
CT15N	15/50W Dummy Load (N type plug)	13.95	(0.75)
CT300	300/1kW Dummy Load 250MHz (SO239)	49.50	(2.00)

SWR-POWER METERS			
Model 110	H.F/2M Calibrated Power Reading	11.50	(0.50)
YW3	H.F/2M Twin Meter	11.50	(0.50)
UH74	2M/70	14.30	(0.50)
T435N	2M/70CM Twin Meter 120W	37.00	(0.75)
DAIWA	CN620A H.F/2M Cross Pointers	57.00	(—)
DAIWA	CN630 2M/70 Cross Pointers	85.00	(—)

DUMMY LOADS		
DL30 PL259 30W MAX	5.00	(0.50)
WELZ CT 15A 50W MAX PL259	7.95	(0.75)
WELZ CT 15N 50W MAX N type	13.95	(0.75)
T100 100W MAX 450MHz	22.95	(0.75)
T200 200W MAX 450MHz	34.00	(0.75)
DL600 600W MAX 350MHz	34.00	(1.50)
WELZ CT300 1000W MAX 250MHz	49.50	(2.00)

YAESU			
FT1	Superb H.F. Transceiver	1349.00	(—)
FT980	H.F. Transceiver	1115.00	(—)
FC902	All Band A.T.U.	135.00	(1.50)
SP901	External Speaker	31.00	(1.50)
FT102	160-10m 9 Band Transceiver	785.00	(—)
FT707	8 B and Transceiver 200W Pep	509.50	(—)
FP707	Matching Power Supply	112.50	(5.00)
FC707	Matching A.T.U./Power Meter	85.00	(1.00)
MMB2	Mobile Mounting Bracket for FT707	16.10	(1.00)
FRG7	General Coverage Receiver	199.00	(—)
FRG7700	200kHz 30MHz Gen. Coverage Receiver	335.00	(—)
FRG7700M	As above but with Memories	399.00	(—)
FRT7700	Antenna Tuning Unit	37.00	(1.00)
FRA7700	Active Antenna Unit	36.40	(1.00)
FT208R	2M FM Synthesised Handheld	199.00	(—)
FT708R	70cm FM Synthesised Handheld	229.00	(—)
NC7	Base Trickle Charger	26.80	(1.30)
NC8	Base Fast/Trickle Charger	44.10	(1.50)
NC9C	Compact Trickle Charger	8.00	(0.75)
FBA2	Battery Sleeve for use with NC7/8	3.05	(0.50)
FNB2	Spare Battery Pack	17.25	(0.75)
PA3	12V DC Adaptor	13.40	(0.75)
FT480R	2M Synthesised Multimode	369.00	(—)
FT780R	70cm Synthesised Multimode (1.6MHz Shift)	409.00	(—)
FT290R	2M Portable Multimode	265.00	(—)
FT90R	70cm Portable Multimode	325.00	
MMB11	Mobile Mounting Bracket	22.25	(1.00)
CSC1	Soft Carrying Case	3.45	(0.75)
NC11C	240V AC Trickle Charger	8.00	(0.75)
FL2010	Matching 10W Linear	54.00	(1.20)
Nicads	2.2 AMP HR Nicads Each	2.50	(—)
FF501DX	H.F. Low Pass Filter 1kW	23.00	(1.00)
FSP1	Mobile External Speaker 8 ohm 6W	9.95	(0.75)
YH55	Headphones 8 ohm	9.90	(0.75)
YH77	Lightweight Headphones 8 ohm	9.90	(0.75)
QTR24D	World Clock (Quartz)	28.00	(1.00)
YM24A	Speaker/Mic 207/208/708	16.85	(0.75)
YD148	Stand Microphone Dual IMP 4 Pin Plug	21.10	(1.50)
YM38	As 34 but up/down Scan Buttons	24.90	(1.50)

FDK VHF/UHF EQUIPMENT			
Multi 750X	2M Multimode Mobile	315.00	(—)
Expander	70cm Transverter for M750E	199.00	(—)

DRAE			
Power Supplies			
4 AMP 30.75 (1.50)	12 AMP	74.00	(2.00)
6 AMP 49.00 (2.00)	24 AMP	105.00	(3.00)
VHF Wavemeter 130-450MHz		27.50	(—)

ICOM		£	c&p
IC 740	H.F. 9 Band Transceiver	725.00	(—)
IC 720A	H.F. tx - Gen. Cov. Rx	949.00	(—)
IC-PS20	P.S.U. for above with Speaker	139.00	(—)
IC-PS15	P.S.U.	119.00	(—)
IC 2KL	H.F. Linear 500 Watts O/P	915.00	(—)
IC 2KLPS	P.S.U. for above	234.00	(—)
IC AT500	1.8-30MHz Auto A.T.U.	339.00	(—)
IC AT100	3.5-30MHz Auto A.T.U.	249.00	(—)
IC 251E	2M Multimode Base Station	559.00	(—)
IC 290E	2M Multimode Mobile	379.00	(—)
IC 25E	2M FM Mobile 25W	269.00	(—)
IC 2E	2M Handheld	169.00	(—)
IC 4E	70cm Handheld	199.00	(—)
IC BC30	Base Charger	45.00	(1.50)
IC HM9	Speaker-Microphone	12.00	(1.00)
IC ML1	10 Watt 2M Booster IC2E	59.00	(1.00)
IC SM5	Desk Mic (3 pin for Icom only)	29.00	(1.00)
IC R70	General Cov. Receiver	499.00	(—)

TV INTERFERENCE AIDS		
Ferrite Rings 1⅛" dia. per pair	0.80	(0.20)
Toroid Filter TV Down Lead	2.50	(0.50)
Trio Low Pass Filter LF30A 1kW	21.00	(1.00)
Yaesu Low Pass Filter FF501DX 1kW	23.00	(1.00)
HP4A High Pass Filter TV Down Lead	5.95	(—)

ANTENNA BITS		
H1-Q Balun 1:1 5kW pep (PL259 Fitting)	9.95	(0.75)
7.1MHz Traps Pair	7.95	(0.75)
T Piece Polyprop Dipole Centre	1.20	(0.30)
Polyprop Strain Insulators	0.40	(0.10)
Small Egg Insulators	0.40	(0.10)
Large Egg Insulators	0.50	(0.10)
4mm Polyester Guy Rope (strength 400kg) pr metre	0.18	(0.04)
75 ohm Twin Feeder-Light Duty-Per Metre	0.16	(0.04)
300 ohm Twin Feeder-Per Metre	0.14	(0.04)
URM67 Low Loss 50 ohm Coax-Per Metre	0.60	(0.20)
UR76 50 ohm Coax-Per Metre	0.25	(0.05)

Please send total postage indicated. Any excess will be refunded

TRIO TS 930S £1216

Amateur band transceiver/General coverage receiver

TRIO			
TS930S	New Transceiver	1216.00	(—)
TS830S	160-10m Transceiver 9 Bands	697.00	(—)
WF0230	Digital V F. O. with Memories	231.00	(2.00)
AT230	All Band ATU/Power Meter	135.00	(2.00)
SP230	External Speaker Unit	41.00	(1.50)
TS430S	160-10m Transceiver	559.00	(—)
TS130S	8 Band 200W Pep Transceiver	456.00	(—)
TS130V	8 Band 20W Pep Transceiver	433.00	(—)
VF0120	External V F O	98.60	(1.50)
TL120	200W Pep Linear for TS120V	167.60	(1.50)
MB100	Mobile Mount for TS130-120	18.60	(1.50)
SP120	Base Station External Speaker	26.45	(1.50)
AT130	100W Antenna Tuner	93.15	(1.50)
PS20	AC Power Supply-TS130V	57.90	(2.50)
PS30	AC Power Supply-TS130S	101.00	(5.00)
MC50	Dual Impeadance Desk Microphone	30.80	(1.50)
MC35S	Fist Microphone 50K ohm IMP	14.70	(0.75)
MC30S	Fist Microphone 500 ohm IMP	14.70	(0.75)
LF30A	HF Low Pass Filter 1kW	21.00	(1.00)
TR9130	2M Synthesised Multimode	433.00	(—)
BO9A	Base Plinth for TR9130	39.00	(1.50)
TR7800	2M Synthesised FM Mobile 25W	257.00	(—)
TR7730	**2M Synthesised FM Compact Mobile 25W**	199.00	(—)
TR2300	2M Synthesised FM Portable	152.00	(—)
VB2300	10W Amplifier for TR2300	65.78	(1.50)
MB2	Mobile Mount for TR2300	21.00	(1.50)
TR3500	70cm Handheld	250.00	(—)
TR2500	2M FM Synthesised Handheld	232.00	(—)
ST2	Base Stand	51.90	(1.50)
SC4	Soft Case	13.80	(0.50)
MS1	Mobile Stand	31.97	(1.00)
SMC25	Speaker Mike	16.10	(1.00)
PB25	Spare Battery Pack	25.07	(1.00)
TRB400	70cm FM Synthesised Mobile Transceiver inc. PS10	299.00	(—)
PS10	Base Station Power Supply for 8400	64.00	(2.00)
TR9500	70cm Synthesised Multimode	450.00	(—)
R2000	200KHz-30MHz Receiver	398.00	(—)
R600	Gen Cov Receiver	257.00	(—)
HC10	Digital Station World Time Clock	67.60	(1.50)
HS5	Deluxe Headphones	23.00	(1.00)
HS4	Economy Headphones	11.27	(1.00)
SP40	Mobile External Speaker	14.26	(1.00)

TELEREADERS (CW & RTTY)			
TASCO CWR 610		189.00	(—)
TONO 500		299.00	(—)
TONO 9000		669.00	(—)

MORSE EQUIPMENT		£	c&p
MK704	Squeeze Paddle	11.95	(0.75)
HK708	Up/Down Key	10.50	(0.75)
—	Practise Oscillator	8.75	(0.50)
EK121	Elbug	33.00	(0.75)
EKM12A	Matching Side Tone Monitor	10.95	(0.75)
EK150	Electronic Keyer	88.00	(—)

ROTATORS			
Hirschman	RO250 VHF Rotor	45.00	(2.00)
S502B	Colorotor (Med. VHF)	56.95	(2.00)
KR400RC	Kenpro-inc tower clamps	125.00	(2.50)
KR600RC	Kenpro-inc tower clamps	175.00	(3.00)

DESK MICROPHONES		
SHURE 444D Dual Impeadance	39.00	(1.50)
SHURE 526T Mk II Power Microphone	53.00	(1.50)
ADONIS AM 303 Preamp Mic. Wide Imp	29.00	(—)
ADONIS AM503 Compression Mic 1	39.00	(—)
ADONIS AM 802 Compression Mic-Meter 3 O/P	59.00	(—)

MOBILITY SAFETY MICROPHONES		
ADONIS AM 202S Clip-on	24.50	(—)
ADONIS AM 202H Head Band-Up Down Buttons	31.00	(—)
ADONIS AM 202F Swan Neck-Up Down Buttons	37.00	(—)

TEST EQUIPMENT			
Drae VHF Wavemeter 130-450MHz		27.50	(—)
DM81 Trio Dip Meter		71.00	(0.75)
MMD50/500 Dig. Frequency meter (500MHz)		75.00	(—)

Co-AXIAL SWITCH		
2 Way Diecast (V.H.F.) SA450	10.00	(0.75)
2 Way Diecast with N sockets	12.95	(0.75)
2 Way Toggle (V.H.F.)	6.00	(0.50)
WESTERN 5 Way 1kW Switch	13.95	(1.00)

HELIAL ANTENNAS		
BNC or PL259 (state which required)	4.50	(0.50)
2M Thread for TR2300 or FT290R (state which)	4.50	(0.50)
70cm BNC or Thread	4.50	(0.50)

MICROWAVE MODULES			
MMT144/28	2M Transverter for HF Rig	109.95	(—)
MMT432/28S	70cm Transverter for HF Rig	159.95	(—)
MMT432/144R	70cm Transverter for 2M Rig	184.00	(—)
MMT70/28	4M Transverter for HF Rig	119.95	(—)
MMT70/144	4M Transverter for 2M Rig	119.95	(—)
MMT1296/144	23cm Transverter for 2M Rig	184.00	(—)
MML144/30	2M 30W Linear Amp	69.95	(—)
MML144/100S	2M 100W Linear Amp (10W I/P)	139.00	(—)
MML144/100LS	2M 100W Linear Amp (3W I/P)	159.00	(—)
MML432/30	70cm 30W Linear Amp (3W1/P)	99.00	(—)
MML432/50	70cm/50W Linear Amp	109.95	(—)
MML432/100	70cm 10/100W Linear Amp	228.64	(—)
MM2001	RTTY to TV Converter	189.00	(—)
MM4000	RTTY Transceiver	269.00	(—)
MMC50/28	6M Converter to HF Rig	29.90	(—)
MMC70/28	4M Converter to HF Rig	29.90	(—)
MMC144/28	2M Converter to HF Rig	29.90	(—)
MMC432/28S	70cm Converter to HF Rig	37.90	(—)
MMC432/144S	70cm Converter to 2M Rig	37.90	(—)
MMC435/600	70cm ATV Converter	27.90	(—)
MMK1296/144	23cm Converter to 2M Rig	69.95	(—)
MMD050/500	500MHz Dig. Frequency Meter	75.00	(—)
MMD600P	600MHz Prescaler	29.90	(—)
MMDP1	Frequency Counter Probe	14.90	(—)
MMA28	10M Preamp	16.95	(—)
MMA144V	2M RF Switched Preamp	34.90	(—)
MMF144	2M Band Pass Filter	11.90	(—)
MMF432	70cm Band Pass Filter	11.90	(—)
MMS1	The Morse Talker	115.00	(—)

D70 MORSE TUTOR £56.35

DATONG PRODUCTS			
RC1	Gen Coverage Converter HF on 2M Rig	137.42	(—)
VLF	Very Low Frequency Converter	29.90	(—)
FL1	Frequency Agile Audio Filter	79.35	(—)
FL2	Multi-mode Audio Filter	89.70	(—)
FL3	Audio Filter + Notch	129.00	(—)
ASP/B	Auto RF Speech Clipper (Trio 4p Plug)	82.80	(—)
ASP/A	Auto RF Speech Clippers (Yaesu 4p Plug)	82.80	(—)
D75	Manually controlled RF Speech Clipper	56.35	(—)
RFC/M	RF Speech Clipper Module	29.90	(—)
D70	Morse Tutor	56.35	(—)
AD270	Indoor Active Dipole Antenna	47.15	(—)
AD370	Outdoor Active Dipole Antenna	64.40	(—)
MPU1	Mains Power Unit	6.90	(—)
MK	Keyboard Morse Sender	137.42	(—)
RFA	Broadband Preamplifier	33.92	(—)
Codecall	Selective Calling Device (link prog)	32.20	(—)
	(switch prog)	33.92	(—)

Buy it with Access

MAIL ORDER Mon-Sat 9-12:30/1:30-5:30

All prices correct at time of going to press

BREDHURST ELECTRONICS

HIGH STREET, HANDCROSS, W.SUSSEX Tel: 0444 400786

RETAIL Mon-Sat 9-12:30/1:30-5:30

BARCLAYCARD VISA

E & OE

AMATEUR RADIO EXCHANGE

A LITTLE BIT OF LOGIC A LITTLE BIT OF LOGIC A LI
IT OF LOGIC **A LITTLE BIT OF LOGIC** A LITTLE BI
BIT OF LOGIC A LITTLE BIT OF LOGIC A LITTLE BIT O

Certainly all the sophisticated new amateur radio equipment on the market today has more than enough logic built into it to keep anybody happy. But what about the natural logic that we are all born with? Do we always apply it as we should, to give us sensible answers?

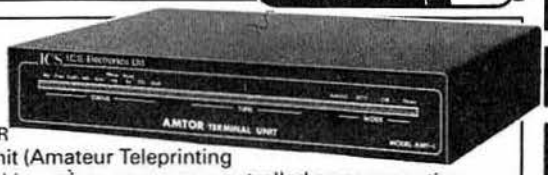
Looking around at all the advertisements and leaflets is enough to confuse even the most technically expert among us. Who can really tell from the picture on the page which rig is going to suit under operating conditions? Why, you can't even judge the size of the thing properly!

So, where can you obtain an unbiased opinion on what is going to be right for you? Certainly not from Mr TRIO, or Mr ICOM, or Mr YAESU. Each will obviously tell you that the equipment he imports is the best of the bunch... and so it may be. But, at least take the opportunity to find out for yourself... by applying a little logic, and coming to the shops where you can compare all the makes, try them out side by side, and then find the one which is right for you.

Buying or selling secondhand equipment?

Have you tried our ARE Central Computer facility yet?

If not, ring our special direct line ***01-992 5789*** and tell us either what you have to sell, or what it is you're looking for, and we'll do the rest.



AMT-1

This AMTOR terminal unit (Amateur Teleprinting Over Radio) is a micro-processor controlled error-correcting data communication system, allowing virtually error-free data transmission between suitably equipped stations. Made in England by ICS Electronics, it offers full AMTOR error-correcting facilities **plus** RTTY, ASCII and CW (transmit only). ● Mode and configuration control from the keyboard of your terminal ● Crystal controlled AFSK generator and 4-pole active receive filter

A milestone in amateur radio communications for just £275.

TS-430S

Trio's latest HF transceiver for mobile or base station use featuring 160-10m operation with general coverage receive ● USB/LSB/CW/AM with optional FM, all mode ● 10Hz step dual digital VFOs ● Eight memories to store frequency, mode and band data ● Lithium battery memory back-up ● Memory scan ● IF shift circuit ● Built-in speech processor, tunable notch filter and noise blanker ● Narrow/Wide filter selection.

Fantastic value at our special price of £699

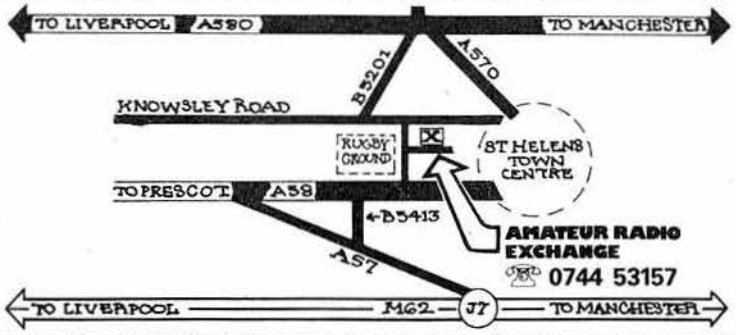
NEW · NEW ·

What are we keeping under wraps?

Could it perhaps be the new YAESU FT-726 VHF base station transceiver... the one we've all been waiting for since they dropped the FT-221R and the FT-225RD?

So new that we do not yet have a photo, but we do know the main specification points and the price – **£649.**

● Triple-band operation on 4m or 6m, 2m and 70cm.
● Plug-in RF heads for each band available separately.
● 2 VFOs ● 10 memories ● 20Hz resolution on CW and SSB.
● IF shift and width control. ● Programmable offset for duplex.



Peter (G4KKN) has already welcomed a large number of amateurs in the North West to our other Shop, in St Helens. For those of you who have not yet found your way to Gladstone Street, however, here is a map to cut out and keep in the shack.

X marks the spot where you will find the widest range of makes and models... an invitation to try them out, one against the other... really knowledgeable advice and service... and coffee brewed to Brenda's secret recipe!

MORE OVER PAGE!

AMATEUR RADIO EXCHANGE

Now available — only thru' us — muTek front-end board for FT290R

FAIRMATE AS-32320

Only from us, this brilliant new-generation scanning receiver giving VHF/UHF coverage of 110-136MHz, 136-162MHz and 296-367MHz. Just look at all the features

- Band scan • Manual UP/DOWN frequency search
- Memory scan of up to 10 selected frequencies in 5kc steps
- Pause-on-scan feature • Lock-out facility • Two memories
- AM/FM facility.

Real value at only £149.

AR-3000

A new air-band receiver representing a breakthrough in technology and price.

- Fully synthesised AM coverage of 110-139.995MHz in 10kc steps with 5kc option • Manual control or auto-scan
- Integral speaker, all within super-compact dimensions of 120mm x 222mm x 44mm • 12v operation making it suitable for base station or mobile use.

A unique product at an amazing price of only £99.

IC-R70

Presenting the best in today's receiver technology from ICOM, featuring:

- Two VFOs • Frequency range 100kc – 30MHz
- Three IFs 70MHz/9MHz/455kHz • HF pre-amp
- Sensitivity 0.5 μv AM – 0.32 μv S/N 12dB

All this...and much more...for £475

MK-4000

The first shipment of our FM scanning receiver sold out very fast indeed, so more have been ordered for the Spring.

Covering 70-87.9875MHz and 140-175.9875MHz in 12.5kc steps on both bands, it has a sensitivity of 0.5μv S/N 20dB and selectivity of 15KHz at –50dB, and an AF output of more than 1.3W.

All that, plus a built-in digital clock for only £99.

AMPLIFIERS – DON'T JUST LOOK – LISTEN!

These two new RF amplifiers from ALINCO (left) are undoubtedly the smallest units yet available in the UK measuring just 156mm x 91mm x 28mm, but there is nothing diminutive about their performance.

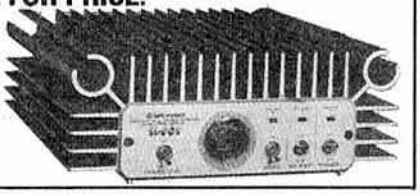
The **ELH-230** has an output of 3W and output of 30W over the frequency range 144-146MHz with a power consumption of 3.5 amps.

The **ELH-710** covers 430-440MHz and has rated input of 1W/3W with output figures of 3W/10W.

Both excellent value at £39 and £59 respectively.

...and at the other end of the size/power scale, the **HL-160V,** pushing out 150W from 3W input, or typically 200W from 15W input, thanks to its two rugged MRF247 transistors. 144-148MHz, FM/SSB/CW.

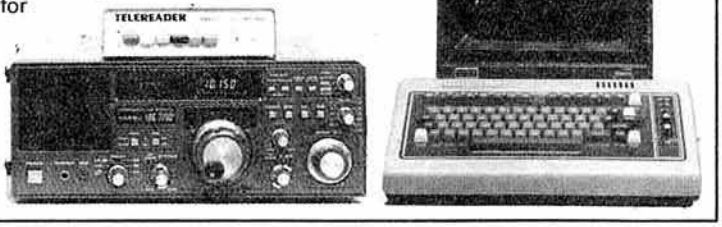
PHONE FOR PRICE.



Ever wanted to decipher all those funny morse code (CW) and radio teletype (RTTY) noises you hear on your communications receiver? Well, now you can – with the new TASCO Telereader CWR-610E.

Simply connect the input side of the Morsemaster to your receiver or transceiver, and the output either to a domestic TV (UHF) or to a proper VDU which we can also supply. RTTY and CW will be automatically demodulated and displayed on the screen, CW at speeds of up to 250 characters per minute, RTTY between 45.5 and 110 Bauds. And the latest version is a Morse-tutor as well, all for just **£189.**

...and if that has whetted your appetite, what about the magnificent **TONO Theta-9000E** which will transmit as well as receive, and goes beyond CW and RTTY to ASCII and graphics as well? Other facilities include word-processing capability, large capacity buffer storage memory, repeat/edit, etc, etc. Exciting high technology for just **£699.**



LICENSED CREDIT BROKERS * Ask for written quotation on HP terms. Also interest-free terms with 50% deposit.

BARCLAYCARD VISA — We welcome Access

All prices include VAT and are correct as we go to press. However, we reserve the right to vary them if forced to do so by the time this advertisement appears.

CREDIT CARD SALES BY TELEPHONE.

Rapid mail order dispatch, with FREE carriage by insured Post or Securicor within the UK mainland.

YAESU

FT980CAT	**NEW** all-mode transceiver with AM/CW/FM/SSB/AFSK	P.O.A.
FT 102	160-10M 9-Band Transceiver **NEW**	775.00
FT ONE	Gen. Coverage Transceiver **NEW**	1345.00
FT 790R	70cm all-mode portable **NEW**	309.00
FT 101ZFM	160-10m 9-Band Transceiver	590.00
FT 101ZDFM	160-10m 9-Band Transceiver	665.00
DIGT 1012	Digital unit	90.00
DCT 101Z	DC Adaptor	42.50
FV 101Z	Remote vfo	112.00
FT902DM	9-Band AM/FM Transceiver ★	795.00
FC 902	9-Band atu, swr/pwr etc	135.00
FTV 901R	Transverter fitted 2m module	285.00
430 TV	70cm module for above	185.00
144 TV	2m module for Transverter	100.00
70 TV	4m module for Transverter	80.00
FV 901DM	Remote vfo for 901	260.00
SP 901	External speaker	31.00
FL 2100Z	9-Band 1200W linear	445.00
FT 77	8-Band solid state 100W **NEW**	469.00
FP 707	230 volts AC power supply	125.00
FC 707	Aerial tuner (unbalanced only)	85.00
MR7	Metal rack for above	15.70
MMB 2	Mobile mounting bracket	16.00
FRG 7	0.5-30MHz receiver	169.00
FRG 7700	SSB/AM /FM recvr. dig. readout	299.00
MEM 7700	Memory unit for above	90.00

CONVERTERS FOR ABOVE

FRV 7700A	118-150MHz	69.75
FRV7700B	50-60MHz & 118-150MHz	75.50
FRV 7700C	140-170MHz	65.95
FRV 7700D	70-80MHz & 118-150MHz	72.45

FRT 7700	Receiver aerial tuner	37.85
FF 5	LF filter for above	9.95
FT 480R	2m all-mode transceiver ★	365.00
FP 80A	230V AC power supply	63.00
FT 780R	70cm all-mode transceiver ★	399.00
FT290RD	**SPECIAL** 1983 version with ARE mods and 3SK87 f/end	259.00
NC 11C	AC charger	8.00
CSC-1	Carrying case	3.45
MMB-11	Mobile mounting bracket	22.25
FT 208R	2m synthesized portable FM	199.00
NC 9C	AC charger	8.00
FT 708R	70cm hand-held	209.00

TRIO-KENWOOD

TS430S	Gen. coverage multi-mode **NEW**	699.00
TS 930	Gen. coverage transceiver **NEW**	P.O.A.
TS 830S	160-10m transceiver 9 bands	P.O.A.
YK 88C	500Hz CW filter	29.60
YK 88CN	270Hz CW filter	32.60
TS 530S	160-10m trans 200w pep digital	P.O.A.
TS 130S	8-band 200W pep	469.00
TS 130V	8-band 20W pep	445.00
AT 130	100W antenna tuner	79.00
TR 2300	2m FM synthesised portable	166.75
TR 2500	2m FM synthesised handheld	217.00
HC 10	Digital desk World Clock	58.75
DM 801	Dip meter	P.O.A.
TR 7730	New 25W FM transceiver	247.00
R 600	Gen. coverage receiver	235.00

ROTATORS

KR 250	Kenpro Lightweight 1-1½" mast	48.00
9502B	Colorotor (Med. VHF)	56.60
KR 400RC	Kenpro – inc. lower clamps	P.O.A.
KR 600RC	Kenpro – inc. lower clamps	P.O.A.

ICOM

IC 740	Multimode H.F. transceiver **NEW**	695.00
IC 720A	HF transceiver and gen. cov. rec.	849.00
IC 730	HF mobile transceiver 8-band	599.00
IC R70	New multimode receiver	475.00
PS 15	Power supply for 720A	109.00
IC 251E	2m multimode base station	539.00
IC 25E	2m synth compact 25W mobile	259.00
IC 290E	2m multimode mobile	389.00
IC 24G	2m FM mobile 10w	169.00
IC 2E	2m FM synthesised handheld	159.00
IC 4E	70cm handheld	189.00
ICL1/2/3	Soft cases	4.25
IC HM9	Speaker/microphone	15.80
IC CP1	Car charging lead	3.75
IC BP2	6V Nicad pack for IC 2E	33.00
IC BP3	9V Nicad pack for IC 2E	23.00
IC BP4	Empty case for 6 X AA Nicads	6.95
IC 8PS	11.5V Nicad pack for IC 2E	44.00
IC DC1	12V adaptor pack for IC 2E	9.75

MICROWAVE MODULES

MMT 144/28	2M Transverter for HF Rig	109.95
MMT 432/28S	70cm Transverter for HF Rig	159.95
MMT 432/144R	70cm Transverter for 2m Rig	184.00
MMT 70/28	4m Transverter for HF Rig	115.00
MMT 1296/144	23cm Transverter for 2m Rig	184.00
MML 144/30LS	2m 30W linear Amp (3WI/P)	69.95
MML 144/50S	2m 50W linear amp (10W1/P)	85.00
MML 144/100S	2m 100W linear Amp (10W1/P)	139.95
MML 432/20	70cm 20W linear Amp (3W1/P)	85.00
MML 432/50	70cm 50W linear Amp	109.95
MML 432/100	70cm 10/100W linear Amp	228.65
MM 2001	RTTY to TV converter	189.00
MM 4001	RTTY transceiver	269.00
MM 4000KB	RTTY transceiver with keyboard	299.00
MMC 50/28	6m converter to HF Rig	29.90
MMC 70/28	4m converter to HF Rig	29.90
MMC 144/28	2m converter to HF Rig	29.90
MMC 432/28S	7cm converter to HF Rig	37.90
MMC 432/144S	70cm converter to 2m Rig	37.90
MMC 435/600	70cm ATV converter	27.90
MMK 1296/144	23cm converter to 2m Rig	69.95
MMD 050/500	500MHz dig. frequency meter	75.00
MMD 600P	600MHz prescaler	29.90
MMDP 1	Frequency counter probe	14.90
MMA 28	10 meter pre amp	16.95
MMA 144V	2m RF switched pre amp	34.90
MMF 144	2m band pass filter	11.90
MMF 432	70cm band pass filter	11.90
MMS 1	The morse talker	115.00
MMS 2	Advanced morse trainer	169.00

MORSE EQUIPMENT

MK 704	Squeeze paddle	10.95
HK708	Up/Down key	11.95
EK 150	Electronic keyer	74.00

MOBILE SAFETY MICROPHONES

ADONIS AM 202S Clip on	21.95
ADONIS AM202F Swan neck + up/dwn bttns	P.O.A.
ADONIS AM202H Head band + up dwn bttns	P.O.A.

DRAE

FULLY PROTECTED POWER SUPPLIES

4 amp	30.75	6 amp	49.00
12 amp	74.00	24 amp	105.00
VHF Wavemeter	130 450MHz		27.50
Morse Tutor			49.00

DATONG

PC1	Gen. Cov. Converter HF on 2m	137.42
VLF	Very Low Frequency Converter	29.90
FL1	Frequency Agile Converter	79.35
FL 2	Multi-mode Audio Filter	89.70
FL 3	FL 2 with auto notch **NEW**	129.37
ASP	Auto R.F. Speech Clipper (Trio or Yaesu plug)	82.90/89.70
D 75	Manually controlled R.F. Speech clipper	56.35
RFC/M	R.F. Speech Clipper Module	29.90
D 70	Morse Tutor	56.35
AD 270	Indoor Active Filter (inc. PSU)	54.05
AD 370	Outdoor Active Filter (inc. PSU)	71.30
MK	Keyboard morse sender	137.42
PTS1	Programmable tone squelch system (two units)	45.99
RFA	Wideband preamplifier	33.92
MPU	Mains Power Unit	6.90

BENCHER

BY 1	Keyer Paddle (black base)	35.84
BY 2	Keyer Paddle (chrome base)	43.72
BY 3	Keyer Paddle (gold plated)	92.00
ZA 1A	Balun 3-5-30mHz for dipoles	15.00
ZA 2A	Balun 14-30MHz for beam ant	17.25

TONO

THETA 9000E	RTTY/CWASC11	669.00
THETA 550	The latest – a winner!	299.00

AMPLIFIERS

UC 70	430MHz 55W + preamp	159.00
2M-50W	144MHz 30-50W	69.00
2M-100W	144MHz 100W + preamp	129.00
MR 150W	144mHz 130-150W + preamp	169.00
MR 250W	144MHz 250W + preamp	325.00

MUTEK

SLNA 144s	144MHz switched pre-amp	33.90
SLNA 144u	Unswitched version of above	20.38
SLNA 144ub	Unboxed version of SLNA 144u	12.41
TLNA 432s	432 MHz 1-4dB NF/13dB gain switched pre-amp	54.90
TLNA 432u	Unswitched version of above	26.40
TLNA 432ub	Unboxed version of TLNA 432u	18.50
BLNA 432ub	1-3dB NF/13dB gain sub-mini 432MHz pre-amp	12.43

TASCO

TeleReader CWR 685 RTTY/CW/ASC11	769.00
TeleReader CWR 670E As above RX only	289.00
MorseMaster CWR 600 As above basic unit	189.00

WELZ

SP 200	1-8-160MHz 20W-200W-1KW	69.95
SP 300	1-8-500MHz 20W-200W-1KW	97.00
SP 400	130-500MHz 5W-20W-150W	69.95
SP15M	1-8-150MHz 0-2-5-20-200W	35.00
SP 380	1-8-500MHz 20W-200W **NEW**	49.00
AC 38M	8 band ATU 400W	65.00
CT-15A	DC-450MHz dummy load	7.95
CT-15N	As above N-type socket	13.95
CH 20A	DC-450MHz coax switch SO239	17.95
CH 20N	As above – N type sockets	31.95

373 UXBRIDGE ROAD, ACTON, LONDON W3 9RH
Tel: 01-992 5765/6/7 *Just 500 yards east of Ealing Common station on the District and Piccadilly Lines, and 207 bus stops outside*

136 GLADSTONE STREET, ST HELENS, MERSEYSIDE
Tel: 0744 53157 *Our North West branch run by Peter (G4 KKN), just around the corner from the Rugby Ground.*

Closed Wednesday at Acton and Monday at St Helens, but use our 24 hour Ansafone service at either shop

SMC SERVICE: FREE FINANCE, FREE CREDIT COVER, GUARANTEE

Earning the title "The Communicators" in the amateur, commercial and marine fields was not gained easily, and we guard our reputation as jealously today, as we did a quarter of a century ago. Maintaining our reputation requires service with a capital 'S'. We offer free Securicor delivery on major equipment, take Access and Barclaycard over the phone, and have superb demonstration facilities.

On many regular priced items for an invoice over £120 we provide *free finance*, 20% down (balance over 6 months) or 50% down and the balance over a year; *you pay no more than the cash price*. Where this service is not available we have taken the worry out of finance: enter a personal loan agreement—remember the deposit can be as low or lower than your monthly instalments—for 12 months to 3 years (at a typical APR rate of 31·8%) and in the event of sickness, accident, compulsory redundancy or death *your credit is covered by SMC*. If you have a card (Access, Barclay or Bankers), or a UK call sign (bring your license with you, or show us the call book entry), it's *INSTANT*.

Should you need a radio repaired, remember we have our own expertly manned service department, equipment with over a hundred thousand pounds of spares and test equipment, and as the importer of most of our merchandise we are in daily contact with the manufacturer.

We are proud to be the largest representative in Europe of Yaesu Musen of Japan who produce the most diverse line of amateur radio equipment in the world. With them, communications is their only business not a sideline, thus providing you with premium products at the forefront of technology.

We are also proud to be chosen as UK representatives by such fine manufacturers as The Japan Radio Company, KDK, Nag, Hansen, Kenpro, TTE, Leson, Telewand, Dengineer, Comet, Fitlay, and Hokushin of Japan, plus HyGain, CDE, Van Gordon, Gem Quad, Channel Master, Mirage, ETO, Dentron, MFJ, and KLM from the Americas.

The items illustrated here form only a tiny fraction of our range: 200 stock lines of Yaesu Musen equipment, 600 different antennas, masts, rotators, coaxes, etc., etc., plus 300 general items of communications equipment, selected as offering the best value in the world from; Jaybeam, Mini Beam, G4MH, Mosley, G-Whip, Bantex, Ascot, Strumech, Microwave Modules, JIR, Bearcat, Delica, Ashidavox, Hi Mound, ICS, Datong, RSGB publications amongst others.

We trust the outline of our services, recommendation from other amateurs (aspiring or veteran) or a visit to your nearest SMC store will convince you to give us a chance to serve.

SMC, your single stop source.

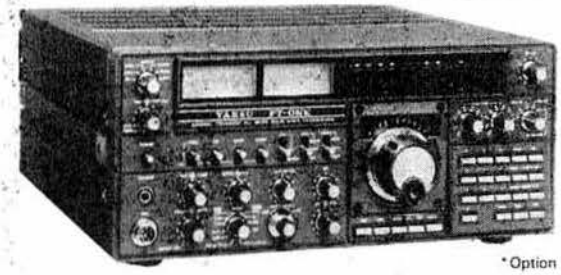
JST100 from JRC

FREE SECURICOR

- ★ 160-10 Metres (inc WARC) plus stand service Rx.
- ★ SSB, CW, FSK, 100 Watts output (adustable).
- ★ 2, 10Hz steps, digital variable frequency oscillators.
- ★ Split frequency or cross mode single frequency operation.
- ★ 3 PLLs (inc BFO) locked to 10MHz reference.
- ★ 11 Channel memory retains operating freq. and mode.
- ★ Listen on memory (fix Tx on VFO), microcomputer control.
- ★ Display of memory contents during operation. Up/down/lock.
- ★ Pass band tuning, tuneable notch, 10-20dB attenuator.
- ★ Adjustable noise blanker, switchable AGC, calibrator.
- ★ Adjustable RF output, RF speech processor, Vox.
- ★ Comprehensive metering including compression level.
- ★ Small 300(W), 327(D), 130(H), (mm). 10kg.

NBD500	Mains PSU.	**NFG97**	ATU
NVA88	Ext. speaker.	**CFL260**	600Hz filter
CHG43	Desk mic.	**CFL230**	300Hz filter
CHG44	Hand mic.	**KY3A**	Morse key

FT ONE £1,349 inc. VAT @ 15% & SECURICOR



*Option

FREE FINANCE

- ★ Rx: 150KHz-30MHz. Continuous general coverage.
- ★ Tx: 160-10m (9 bands) or 1.5-30MHz commercial.
- ★ All Modes: AM, CW, FM*, FSK, LSB, USB.
- ★ 10 VFO's!!! Any Tx-Rx split within coverage.
- ★ Two frequency selection ways, *no* bandswitch.
- ★ Main dial, velvet smooth, 10Hz resolution.
- ★ Inbuilt keyboard with up/down scanning.
- ★ Dedicated digital display for RIT offset.
- ★ Receiver dynamic range up to 100dB!!!
- ★ SSB: Variable bandwidth *and* IF shift.
- ★ 300* or 600Hz*, 2,400 → 300Hz, 6kHz*, 12kHz*.
- ★ Audio peak and notch filter. FM squelch.
- ★ Advanced variable threshold noise blanker.
- ★ 100W RF, key down capability, solid state.
- ★ Mains and 12VDC. Switch mode PSU built in.
- ★ RF processor. Auto mic gain control. VOX.
- ★ Last but not least *full* break in on CW.

SOUTH MIDLANDS COMMUNICATIONS LTD

S. M. HOUSE, RUMBRIDGE STREET, TOTTON, SOUTHAMPTON SO4 4DP, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton.

GRIMSBY
S.M.C (Humberside)
247A Freeman Street,
Grimsby, Lincolnshire.
Grimsby (0472) 59388
9.30-5.30 Tue-Sat

STOKE
S.M.C. (Stoke)
76 High Street,
Talke Pits, Stoke.
Kidsgrove (07816) 72644
9-5.30 Tue-Sat

LEEDS
S.M.C. (Leeds),
257 Otley Road,
Leeds 16, Yorkshire.
Leeds (0532) 782326
9-5.30 Mon-Sat

CHESTERFIELD
S.M.C. (Jack Tweedy) LTD.
102 High Street,
New Whittington, Chesterfield.
Chesterfield (0246) 453340
9-5 Tue Sat

BUCKLEY
S.M.C. (T.M.P.),
Unit 27 Pinfold Workshops,
Pinfold Lane, Buckley
Buckley (0244) 549563
9.30-5.30 (Lunch 1.30) Tue-Sat

JERSEY
SMC (Jersey)
1, Belmont Gardens
St Helier, Jersey
Jersey (0534) 26788
9-6 Mon-Sat

STOCK-CARRYING AGENTS WITH DEMONSTRATION FACILITIES

Edinburgh	Jack	GM8GEC	031-657 2430 Day 031-665 2420 Eve	Bangor Tandragee	John Mervyn	GI3KDR GI3WWY	(0247) 55162 (0762) 840656	Neath	John	GW4FOI	(0639) 52374 Day (0639) 2942 Eve

FT980 £1,115 inc VAT @ 15% & SECURICOR

INSTANT HP

★ Notch filter in IF (AGC immune to hetrodynes).
★ Full break in keying. 500/600/700Hz beat.
★ Unique analogue scale of digital type.
★ Comprehensive twin meter metering.
★ Memory retains mode information.
★ Rx 150kHz-30MHz.
★ Tx 160-10m 9 bands + 3 × 500kHz Aux bands.
★ All modes AM, CW, LSB, USB, AFSK, FM standard.
★ IF shift + variable bandwidth 2·6kHz-300Hz.
★ Inbuilt keyboard operation + Scanning.
★ Switchable attenuator 10, 20, 30dB.
★ Audio peak + notch filter – 40dB.
★ RF process or Auto mic gain control.
★ 3rd order IMD – 40dB at 100W PEP.
★ AFSK shift 170, 425, 850Hz selectable.
★ Multi channel memory + programmable scan limits.

FT902DM £885 inc. VAT @ 15% & SECURICOR

★ 160-10 metres including new allocations.
★ Variable IF bandwidth 2.4kHz down to 300Hz.
★ Audio Peak and independent notch controls.
★ AM, FSK, USB, LSB, CW, FM, (Tx and Rx).*
★ Semi-break in, inbuilt Curtis IC Keyer included.
★ Digital plus analogue frequency displays.
★ VOX built-in and adjustable.
★ Instant write in memory channel.**
★ Tune up button (10 sec, of full power).
★ Switchable AGC and RF attenuator.
★ Optional 350 or 600Hz CW, 6kHz AM filters included.
★ Clarifier (RIT) switchable on Tx, Rx or both.
★ Plug in modular, computer style constructor.
★ Fully adjustable RF Speech processor.
★ Ergonomically designed with necessary LEDS.
★ Incredible range of matching accessories.
★ Universal power supply 110-234V AC and 12V DC.**

'PLASTIC' BY PHONE

*Option ** D & DE Models

FT102 £785 inc. VAT @ 15% & SECURICOR

FREE CREDIT COVER

★ 1.8-3.5-7-10-14-18-21-24.5-28MHz
★ All modes: LSB, USB, CW, AM†, FM†, (†Option board)
★ Front end: extra high level, operates on 24V DC
★ RF stage bypassable, boosts dynamic range over 100 dB!
★ Variable bandwidth 2.7KHz→500Hz *and* IF Shift
★ Fixed bandwidth filters, parallel or cascade
★ IF notch (455kHz) *and* independent audio peak
★ Noise blanker adjustable for pulse *width*
★ External Rx and separate Rx antenna provisions
★ *Three* 6146B in special configuration – 40dB IMD!
★ Extra product detector for checking Tx IF signal
★ Dual meter, peak hold ALC system
★ Mic amp with tunable audio network

SP102: – Speaker, Hi and Lo AF filters, 12 responses!
FV012: – VFO, 10Hz steps and readout, scanning, QSY
FC102: – ATU, 1·2KW, 20/200/1200 W FSD PEP, wire
FAS-1-4R: – 4 way waterproof antenna selector

★ 160-10 metres including new allocations.
★ Variable IF bandwidth 2.4kHz down to 300Hz.
★ Selectable CW fixed bandwidth CW-W and CW-N*.
★ Semi-break in with sidetone for excellent CW.
★ Digital plus analogue frequency displays (ZD models).
★ 180W PIP and – 31dB 3rd order intermod.
★ RF speech processor fitted – adjustable level.
★ VOX built-in and is adjustable from the front panel.
★ Wide dynamic range for big signal handling.
★ High usable sensitivity, for those weak ones.
★ Superb noise blanker – adjustable threshold.
★ Attenuator; 0-10-20dB, AGC; slow-fast-off.
★ Clarifier (RIT) switchable on Tx, Rx or both.
★ Low level transvertor drive output facility.
★ Universal power supply 100-234V AC and 12V DC*
★ Incredible range of matching accessories.
★ 6 models: Digital/Analogue – AM/FM options.

*** SPECIAL OFFER ***

Buy any FT101Z and you get a free FV101Z VFO worth £112.00 (Limited number available)

FT101Z £559 inc. VAT @ 15% & SECURICOR

*Option

FT707 £509 inc. VAT @ 15% & SECURICOR

2 YEAR GUARANTEE

SMC FM MODIFIED VERSION AVAILABLE; £40 EXTRA

★ 80-10 metres (including 10, 18 and 24MHz bands).
★ USB-LSB-CWN-AM (Tx and Rx operation).
★ 100W PEP. 50% power output at 3:1 VSWR.
★ Full "broad band" no tune output stage.
★ Excellent Rx dynamic range, power transistor buffers.
★ Rx Schottky diode ring mixer module.
★ Local oscillator with ultra-low noise floor.
★ Variable IF bandwidth – 16 crystal poles.
★ Bandwidths 6kHz*, 2.4kHz-300Hz, (600-350) Hz*.
★ AGC; slow-fast switchable VOX built-in.
★ Semi-break in with side tone for excellent CW.
★ Digital (100Hz) plus analogue frequency display.
★ LED Level meter reads: S, PO and ALC.
★ Indicators for: calibrator, fix, int/ext VFO.
★ Receiver offset tuning (RIT-clarifier) control.
★ Advanced noise blanker with local loop AGC.

*Option

FT230R £239 inc VAT @ 15% & CARRIAGE

- 150(W) × 50(H) × 176(D)mm.
- Up/down, memory/band scanning.
- Easy "write-in" memory channels.
- Memory backup "5 year" lithium cell.
- Ten memories with priority functions.
- Supplied with scanning microphone.
- Illuminated "any angle" LCD display functions.
- Display to 100's of Hz.
- Two completely independent VFO's.
- Operation between memory and VFO.
- Full reverse repeater function.
- Manual and automatic tone burst.
- Large "full sound" internal speaker.
- Concentric volume and squelch.

2 or 70!

- 144-146MHz (extensions possible).
- 25W RF output, 3W on low.
- 25 and 12½kHz steps provided.
- ±600kHz repeater split, 1750Hz burst.
- Tx; 5A. Rx 300mA (standby).

FT730R £285 inc VAT @ 15% & SECURICOR

- 430-434MHz (440-445MHz possible).
- 10W RF output, 1W on low.
- 25 and 100kHz steps provided.
- ±1.6 MHz repeater split, 1750Hz burst
- Tx 3A, Rx 300mA (standby).

'790 EX-STOCK

- Multimode USB, LSB, FM, CW
- Optically coupled main tuning
- 100Hz backlit LCD Frequency display
- 10 memory channels "5 year" backup
- Any Tx/Rx split with dual VFOs
- Up/down tuning from microphone
- AF output 1W @ 10% THD
- Bandwidth 2·4kHz and 14kHz @ −6dB
- LED's, "on air", "busy" m/c meter; S.PO
- 58 (H) × 150 (W) × 195 (D). 1.3kg

SMC8C	Slow Charger (220mA)	**£8.80**
MMB 11	Mobile Mount	**£22.25**
CSC1A	Soft carrying case	**£3.45**
FL2010	Linear Amplifier 2m 10W	**£59.00**
FL7010	Linear Amplifier 70cms	**£91.00**

6, 2 or 70!

FT290R £265 inc VAT @ 15% & POSTAGE

- 144-146MHz (144-148 possible)
- 2.5W PEP, 2.5W 300mW out or FM
- FM: 25kHz and 12.5kHz steps
- SSB: 1kHz and 100Hz steps
- ±600kHz repeater split, 1750kHz burst
- Integral telescopic antenna
- Rx, 70mA, Tx; 800mA (FM maximum)

FT790R £325 inc VAT @ 15% & POSTAGE

- 430-330MHz (440-450 alternative)
- 1W PEP, 1W/250mW FM/CW out
- FM: 100kHz and 25kHz steps
- SSB: 1kHz and 100Hz steps
- 1·6MHz shift with input monitor, 1,750Hz burst
- Rx: 100mA/200mA. Tx; 750mA maximum
- BNC Mounted ¼λ flexi antenna included

SPECIAL OFFER

- USB-LSB-CW-FM (A3j, A1, F3)
- 30W PIP A3j, 10/1 W out A1 F3
- Any TX Rx split with dual VFO's
- Four easy write-in memory channels
- Memory scanning with slot display
- Up/down tuning/scanning from mic.
- Priority channel on any memory slot
- Digital RIT. Advanced noise blanker
- Satellite mode allows tuning on Tx
- Semi break in with side tone
- Very bright blue 100Hz digital display
- Display shows Tx & Rx freq (inc RIT)
- String LED display for "S" and PO
- LED's; "On Air", Clar, Hi/Low, FM mod.
- Size (Case): 8.3" D, 2.3" H, 6.9" W

Buy a FT480R and FT780R and get a free SC1 Station Console illustrated above. Worth £134.55. (Limited number available).

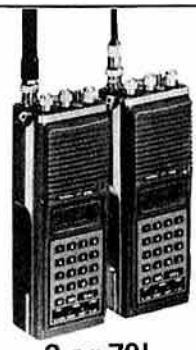
FT480R (2m) £369 inc VAT @ 15% & SECURICOR

- 144-146MHz (143.5-148.5 possible)
- ±600kHz standard repeater split
- Excellent dynamic range and sensitivity
- FM; 25, 12½, 1kHz steps
- SSB; 1,000, 100, 10Hz steps

- FT780R1·6 fitted 1·6MHz Shift **£459** inc.
- 430-434MHz (440-445) possible
- GaAs Fet RF for incredible sensitivity
- FM; 100kHz, 25kHz, 1kHz, steps
- SSB; 1,000, 100, 10Hz steps

FT780R (70cm) £399 inc VAT @ 15% & SECURICOR

- Keyboard entry of frequencies/splits
- LCD digital display with backlight
- Any split + or − programmable
- Ten memory channels "5 year" back up
- Up/down manual tuning. Memory scan
- Manual or auto scan for busy/clear
- Priority channel with search back
- Scan between any two frequencies
- Auto scan restart. 1,750Hz tone burst
- Built in condenser microphone
- 500mW to int/ext speaker
- External speaker/mic available
- 168(H) × 61(W) × 39(D)mm
- C/w Quick change NiCad pack, helical



2 or 70!

FT208R £209 inc VAT @ 15% & POSTAGE

- 144-146MHz (144-148 possible)
- 12.5/25kHz synthesizer steps
- ± 600kHz repeater split
- 2.5 or 0.3W RF output
- Rx: 20mA squelch 150mA max AF
- Tx: 800mA at 2.5W RF
- 0.25μV for 12dB SINAD

FT708R £229 inc VAT @ 15% & POSTAGE

- 430-440MHz (440-450 alternative)
- 25kHz synthesizer steps
- ±7.6MHz EU split standard
- 1W or 100mW RF output
- Rx 20mA squelch, 150mA (max AF)
- Tx:500mA it 1W RF
- 0.4μV for 12dB SINAD

2 and/or 70!!

- Four easy write-in memory channels
- Rx priority channel (auto check)
- Scanning band/memory empty/busy
- Up/down tuning/scanning from mic.
- Optically coupled tuning control
- Manual and automatic tone burst
- String LED's for 'S' and PO. 7 status LEDs
- 1½W of audio to internal/external speaker

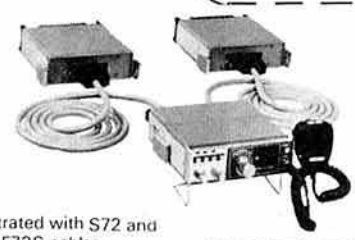
FT720 Control Head

- 3.3 (4.3)" D × 6" W × 2 (2.2)" H

S72 Switching box

- Pushbutton band change Auto steps/splits

E72S Extension cable, 2m long
E72L Extension cable, 4m long
MMB3 Mobile Mounting bracket for deck



illustrated with S72 and two E72S cables

FT720RV £199 inc VAT @ 15% & SECURICOR

- 144-146MHz (144-148MHz possible)
- 12½kHz synthesizer, 600kHz shift
- 0.3μV for 20dB quieting
- Rx 0.5A. Tx RV 3.5A, RVH 6.5A
- 5.8 (6.5)" D × 6" W × 2(2.2)" D

- 430-434MHz
- 25kHz synthesizer steps, 1.6MHz shift
- 0.5μV for 20dB quieting
- Rx; 0.5A, Tx; 4.5A
- 5.8 (6.5)" D × 6" W × 2(2.2) " D

FT720RU £229 inc VAT @ 15% & SECURICOR

★ THE FT7B IS DEAD! LONG LIVE THE FT77! ★

The FT77 is an all new 80-10m (inc. WARC) 100 Watt, transceiver, ideal for mobile (no tune, inbuilt SWR meter, only 3¾" × 9½" and less than a foot deep—including heat sink!) or as the heart of a base station with its compatibility with the FTV707 transverter (N.B. FM option available), and the FV707DM digital external memory VFO etc. Operational simplicity is the keynote of this design, nevertheless features demanded by today's discriminating amateurs have not been neglected including dual selectable

noise blanker pulse widths (eliminates woodpecker or impulse noise) and optional narrow CW filter. The FT77 is the perfect first rig or second transceiver for an OT. Computer aided design of circuit board for efficient component layout, automatic parts insertion for high reliability at low cost:

FT77	Transceiver 100W	**£475·00**
FT77S	Transceiver 10W	**£359·00**
MARK77	Xtal marker board	**£7·65**
FMU77	FM unit	**£23·75**

COMMUNICATION RECEIVER: NRD515 £985 inc VAT @ 15% & SECURICOR

- ★ 30MHz to 100kHz or lower, 100Hz steps.
- ★ PLL digital VFO, stable (50Hz/hr AWU).
- ★ Backlash free, 500Hz analogue calib.
- ★ Fast tune up/down switch, dial lockout.
- ★ SSB (USB/LSB), CW, AM, RTTY.
- ★ 6 and 2.4kHz, 600* and 300* Hz @ −6dB.
- ★ Passband tuning ±2kHz on SSB and CW.
- ★ Variable BFO on CW for preferred tone.
- ★ Modular plug in design with mother board.
- ★ Reliable—low power schottky & CMOS.
- ★ Designed for maximum ease of operation.
- ★ Noise blanker 0-10-20dB attenuator.
- ★ Small (140 × 340 × 300mm) light 7½Kg.

PROFESSIONAL MONITOR

- ★ Up conversion, 70.455MHz and 455kHz
- ★ No R.F. amplifier, balance U310 mixer
- ★ Crystal filter before first IF amplifier
- ★ Transceiver provisions; sidetone, trip etc.
- ★ Frequency data input/output port.

NHD518	96 (4 × 24) channel memory unit.
NCM515	Remote frequency keypad controller, LCD readout. 4 channel memory Up/down step tuning.
CQE515	Junction unit (NCM515 to NHD518).
NVA515	External 3W speaker.
CFL260	600Hz mechanical filter
CFL230	300Hz crystal filter

★ NEW—FT726R, 3 BAND, MULTIMODE, VHF/UHF ★

The FT726R is a revolutionary combination of a full feature VHF/UHF transceiver with the deluxe facilities (which you have always wondered why were only available on HF transceivers) such as IF shift and variable bandwidth for SSB and CW operations plus a full duplex option for the ultimate cross band and satellite transceiver!
The transceiver main frame accepts 3 modules, 2 metres (standard), 430-440MHz and 6 metres (options). Modes catered for are SSB-CW-FM with optimum provisions made for each: 20Hz steps for SSB/CW,

selectable steps for FM (also preset and programmable repeater splits), plus a A & B VFO system with 10 memory channels. Surely the development of the decade in VHF/UHF transceiver technology.

FT726R(2)	Transceiver inc. 145MHz	**£649·00**
SAT726	Full duplex unit	**£82·80**
430T726	430-440MHz module	**£208·90**
50T726	Six metre module	**£157·15**

RECEIVER WITH 12 MEMORIES: FRG7700M £399 inc VAT @ 15% & SECURICOR

- ★ 30MHz down to 150kHz (and below).
- ★ 12 Channel memory option with fine tune.
- ★ SSB (LSB/USB), CW, AM, FM.
- ★ 2·7kHz, 6kHz, 12kHz, 15kHz, @ −6dB.
- ★ 3 Selectivities on AM. Squelch on FM.
- ★ Up conversion, 48MHz first IF.
- ★ 1kHz digital, plus analogue, display.
- ★ Inbuilt quartz clock/timer.
- ★ No preselector, auto selected LPF's.
- ★ Advanced noise blanker fitted.
- ★ Antenna 500Ω to 1·5MHz, 50Ω to 30MHz.
- ★ 20dB pad plus continuous attenuator.
- ★ Switchable A.G.C. Variable tone.

'7700 THE ONE WITH FM!
NON-MEMORY VERSION £335

- ★ 110 and 240Vac, 12Vdc option.
- ★ Signal meter calibrated in "S" and SIMPO.
- ★ Acc; Tuners, Converters, LPF, Memory.
- ★ FRT7700; 150kHz-30MHz, Switch, etc.
- ★ FRV7700A; 118-130, 130-140, 140-150MHz.
- ★ FRV7700B; 118-130, 140-150, 50-59MHz.
- ★ FRV7700C; 140-150, 150-160, 160-170MHz.
- ★ FRV7700D; 118-130, 140-150, 70-80MHz.
- ★ FRV7700E; 118-130, 140-150, 150-160MHz.
- ★ FRV7700F; 118-130, 150-160, 170-180MHz.
- ★ FF5; 500kHz (for improved VLF reception).
- ★ MEMGR7700; 12 Channels (internal fitting).
- ★ FRA7700; Active Antenna.

SOUTH MIDLANDS COMMUNICATIONS LTD

S. M. HOUSE, RUMBRIDGE STREET, TOTTON, SOUTHAMPTON SO4 4DP, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton.

GRIMSBY
S.M.C (Humberside)
247A Freeman Street,
Grimsby, Lincolnshire.
Grimsby (0472) 59388
9.30-5.30 Tue-Sat

STOKE
S.M.C. (Stoke)
76 High Street,
Talke Pits, Stoke.
Kidsgrove (07816) 72644
9-5.30 Tue-Sat

LEEDS
S.M.C. (Leeds),
257 Otley Road,
Leeds 16, Yorkshire.
Leeds (0532) 782326
9-5.30 Mon-Sat

CHESTERFIELD
S.M.C. (Jack Tweedy) LTD,
102 High Street,
New Whittington, Chesterfield.
Chesterfield (0246) 453340
9-5 Tue-Sat

BUCKLEY
S.M.C. (T.M.P.),
Unit 27 Pinfold Workshops,
Pinfold Lane, Buckley.
Buckley (0244) 549563
9.30-5.30 (Lunch 1.30) Tue-Sat

JERSEY
SMC (Jersey)
1, Belmont Gardens
St Helier, Jersey
Jersey (0534) 26788
9-6 Mon-Sat

STOCK-CARRYING AGENTS WITH DEMONSTRATION FACILITIES

Edinburgh Jack GM8GEC (031-657 2430 Day (031-665 2420 Eve
Bangor John GI3KDR (0247) 55162
Tandragee Mervyn GI3WWY (0762) 840656
Neath John GW4FOI (0639) 52374 Day (0639) 2942 Eve

hy-gain

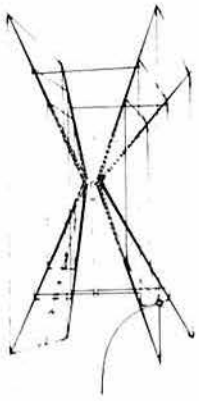
The TH7DXX is a new 7 element (10-15-20M) broadband VSWR less than 2:1 at band edges! Compact 20' (6·1M) turning radius—31' (9·4M) longest element dual driven element Yagi which by combining monoband *and* high Q, ultra high power, trapped parasitics provides an average front to back of 22dB on 20 and 15 and 17dB on 10 meters. The antenna weighs 75lbs (34kg) and its projected 9·4 sq feet (0·9 sq m) of wind area produces a load of 240lbs at 80 mph (129 kph).

Construction features include: 6063-T832 taper swaged thick wall aluminium, 18-8 stainless hardware, diecast ali boom/mast clamps, heavy gauge ele/boom clamp and rugged phasing lines. It uses a ß match for DC ground and comes complete with preformed feeder straps and the famous BN86 ferrite balun.

		inc VAT	p/p
12AVQ	Vertical 10-20m inc.	**£50.60**	£2.50
14AVQ/WB	Vertical 10-40m inc.	**£64.40**	£2.50
18AVT/WB	Vertical 10-80m inc.	**£113.85**	£2.50
14RMQ	Roof mounting Kit	**£38.52**	£2.50
18V	Vertical 10-80m inc.	**£36.22**	£2.50
103BA	3 Ele Yagi 10m	**£67.85**	£3.50
105BA	5 Ele Yagi 10m	**£155.25**	£3.95
153BA	3 Ele Yagi 15m	**£90.85**	£3.50
155BA	5 Ele Yagi 15m	**£236.90**	£5.90
203BA	3 Ele Yagi 20m	**£178.25**	£4.90
204BA	4 Ele Yagi 20m	**£286.35**	£7.30
205BA	5 Ele Yagi 20m	**£396.75**	£9.40
402BA	2 Ele Yagi 40m	**£247.25**	£6.50
DB10/15A	3 Ele Yagi 10-15m	**£198.95**	£4.80
TH3JNR	3 Ele Yagi 10-15-20m	**£202.40**	£3.50
TH2MK3	2 Ele Yagi 10-15-20m	**£169.05**	£3.50
TH3MK3	3 Ele Yagi 10-15-20m	**£274.85**	£5.30
TH5DXX	"Thunderbird" 5 el.	**£419.75**	£6.70
TH7DXX	"Thunderbird" 7 el.	**£511.75**	£8.75
HYQUAD	2'Ele Quad 10-15-20m	**£354.20**	£6.00
18TD	Dipole Tape 10-80m	**£121.90**	£2.80
BN86	Balun 1:1·3 30MHz	**£16.67**	£1.80
LA1	Lightning Arrestor	**£59.05**	£1.20

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

Gem Quad



A light strong, boomless, quad antenna covering 10-15-20m. The centre spider is aluminium and the spreader arms (13·6ft and 2·2lb) are of a glass fibre tridectic construction. (Thin rods forming a triangle with tape criss-crossing for light, rigid, low wind resistance structure.)

The double cone shape offers optimum spacing between loops and maintains these critical measurements even under severe weather conditions. This optimum spacing provides "monobander" performance; high gain, maximum capture area, low angle radiation, low SWR and good F/B and F/S ratios. The toroidal balun supplied provides single 50 ohm coaxial feed on all bands, with no lossey coils, traps or switches.

2 element 18' × 18' × 9½"; TR 9½"; 8dB Gain; 25dB F/B
3 element As 2 ele plus 6·5 boom; 8·9dB Gain; 30dB F/B.
4 element As 2 ele plus 13' boom; TR 22'.

GQ2E	2 Ele Antenna	**£253.00**	£5.40
GQ3E	3 Ele Antenna	**£425.00**	£9.20
GQ4E	4 Ele Antenna	**£573.85**	£10.00
GQCK1	Conversion Kit 1 Ele	**£172.50**	£4.10
GQCK2	Conversion Kit 2 Ele	**£322.00**	£6.70
GQSPIDER	Centre piece (spare)	**£33.92**	£2.50
GQSPREADER	Spreader Arm (spare)	**£20.13**	£3.20

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

J-BEAM

4 METRES				
4Y/4M	Yagi 4 element	7dBd	**£29.90**	£2.20
PMH2/4M	Phasing harness 2 way		**£16.10**	£1.50
2 METRES				
H0/2M	Halo head only	0dBd	**£5.98**	£1.20
HM/2M	Halo with 24" mast	0dBd	**£6.55**	£1.50
C5/2M	Colinear omni vert	4·8dBd	**£54.62**	£2.50
LW5/2M	Yagi 5 element	7·8dBd	**£14.37**	£2.50
LW8/2M	Yagi 8 element	9·5dBd	**£17.82**	£2.50
LW10/2M	Yagi 10 element	10·5dBd	**£24.15**	£2.50
LW16/2M	Yagi 16 element	13·4dBd	**£35.07**	£3.20
14Y/2M	Yagi 14 element	12·8dBd	**£36.23**	£3.20
PBM10/2M	10 ele Parabeam	11·7dBd	**£44.85**	£3.20
PBM14/2M	14 ele Parabeam	13·7dBd	**£55.77**	£3.20
Q4/2M	Quad 4 element	9·4dBd	**£29.32**	£2.50
Q6/2M	Quad 6 element	10·9dBd	**£39.10**	£2.50
Q8/2M	Quad 8 element	11·9dBd	**£44.85**	£2.50
D5/2M	Yagi 5 over 5 slot	10dBd	**£25.30**	£2.50
D8/2M	Yagi 8 over 8 slot	11·1dBd	**£34.50**	£2.50
5XY/2M	Yagi 5 ele crossed	7·8dBd	**£28.17**	£2.50
8XY/2M	Yagi 8 ele crossed	9·5dBd	**£35.65**	£2.50
10XY/2M	Yagi 10 ele crossed	10·8dBd	**£46.00**	£2.50
PMH2/C	Harness cir polarisation		**£9.77**	£1.50
PMH2/2M	Harness 2 way 144MHz		**£12.65**	£1.50
PMH4/2M	Harness 4 way 144MHz		**£28.75**	£1.50
SEVENTY CM				
C8/70	Colinear Omni Vertical	6·1dBd	**£62.10**	£2.50
D8/70	Yagi 8 over 8 slot	12·3dBd	**£25.87**	£2.50
PBM18/70	18 ele Parabeam	13·5dBd	**£32.20**	£2.50
PBM24/70	24 ele Parabeam	15·1dBd	**£42.55**	£2.50
LW24/70	Yagi 24 element	14·8dBd	**£27.02**	£2.50
MBM28/70	28 ele Multibeam	11·5dBd	**£21.27**	£2.50
MBM48/70	48 ele Multibeam	14·0dBd	**£35.65**	£2.50
MBM88/70	88 ele Multibeam	16·3dBd	**£48.87**	£2.50
8XY/70	Yagi 8 ele crossed	10dBd	**£42.55**	£2.50
12XY/70	Yagi 12 ele crossed	12dBd	**£52.90**	£2.50
PMH2/70	Harness 2 way		**£10.35**	£1.50
PMH4/70	Harness 4 way		**£22.42**	£1.80
1296 MHz				
CR2/23CM	Corner reflector	13·5dBd	**£40.25**	£2.50
PMH2/23CM	Harness 2 way		**£31.05**	£1.50

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

Kenpro

KR600RC
£163.30

360° round type meter Max. load 200kg. Rot, 600kg/cm, brake 4,000kg/m. 1¼in-2½in masts Lower casting optional.

KR400RC
£114.94

360° round type meter Max. load 200kg. Rot, 400kg/cm, brake 1,500kg/cm 1¼in-2½in masts Lower casting optional.

KR500
£112.12

Elevation Rotator (180°) Up to 50kg of Load. 1½in-2½in mast. 1¼in-1⅝in boom

KR250
£54.91

Twist and switch controller. Rotator 200kg/cm. Brake 600kg. 1in-1½in masts.

NB: PRICES INCLUDE VAT AT 15%
Carriage free (post or road) mainland only

Channel Master

9508
£80.21

Auto control, secondary pointer gives position during travel. Stainless steel hardware. Heaviest duty "offset type". To 5sq

Takes 1-2" masts and 1-2" stub.

9502
£56.92

Automatic control box. Dial direction secondary pointer gives position during travel.

Takes 1-2" mast and 1-1⅞" stub.

Upper mast support bearing.

2" mast and 1¼" stub.

Post and packing **£1.80**
9523 **£15.81**

Rotary bearing 3-way guying.

Takes 1²⁹⁄₃₂" mast.

Post and packing **£1.50**
9525 **£16.67**

NB: PRICES INCLUDE VAT AT 15%
Carriage free (or as shown) mainland only

CDE

AR40
£90.85

Accurate, silent self-calibrating control box. Dial up desired beam heading, push knob; motor rotates to that position and then switches off.

CD45
£136.85

Large illuminated meter gives read out of antenna heading at all times. Armature brake. Low voltage meter. Handles antennas to 8½sq ft.

HAM IV
£258.75

Large illuminated meter gives read out of antenna heading at all times. wedge solenoid brake mechanism. Handles antennas to 15sq ft.

T2X
£327.75

Large illuminated meter gives read out of antenna heading at all times. Wedge solenoid brake mechanism. Handles antennas to 30sq ft.

NB: PRICES INCLUDE VAT AT 15%
Carriage free (post or road) mainland only

SOUTH MIDLANDS COMMUNICATIONS LIMITED

BRANCHES: CHESTERFIELD · GRIMSBY · STOKE · LEEDS · BUCKLEY · JERSEY

COAX SMC PLUGS

BNC PLUG 50 ohms

UG88	Standard type 5.5mm	£0.78
UG599	Large type 11.2mm	£3.22

BNC SOCKET 50 ohms

UG290	Standard 4 hole type	£0.78
UG1094	Nut fixing type	£0.76
UG69	Free, cable-end, 5.5mm	£0.94

BNC COUPLER 50 ohms

UG914	Back to back female	£1.07
UG491	Back to back male	£1.66
UG274	'T' 2 female 1 male	£2.23
SMC3FBNC	'T' 3 female	£2.02
UG306	Elbow, Male-Female	£1.86

BNC INTERSERIES ADAPTOR 50 ohms

UG255	BNC plug—UHF socket	£1.76
UG273	BNC socket—UHF plug	£1.76
UG201	BNC socket—N plug	£3.28
UG349	BNC plug—N socket	£3.16
UG606	BNC socket—N socket	£2.59

UHF PLUG

PL259	Standard type 11.2mm	£0.55
PL259P	Push on type 11.2mm	£0.79
UG175	Reducer 5.0mm	£0.14
UG176	Reducer 5.6mm	£0.14
PL259R	Reduced type 5.0mm	£0.67
PL259A	Deluxe type 11.2mm	£1.50
PL259B	Deluxe type 5.0mm	£1.13
PL259SL	'Solderless' 11.2mm	£0.63
PL259SS	'Solderless' 5.0mm	£0.63
PL259E	Angle type 5.0mm	£0.95
PL259M	Metric type standard 11.2mm	£0.75
L42P	For LDF2/50 Heliax	£10.58
L44P	For LDF4/50 Heliax	£10.35
PL259PM	Panel mount 4 hole	£1.07

UHF SOCKET

S0239F	Standard 4 hole fix	£0.48
S0239F31000	4 hole PTFE Au plate	£0.97
S0239T	2 hole fixing type	£0.48
S0239NI	Nut fixing inside type	£0.59
S0239NO	Nut fixing outside type	£0.59
S0239E	Free angle type 5.0mm	£1.01
	Free cable end 5.0mm	£2.22
MX913/C	Dust Cap c/w chain	£0.46
MX913/M	Dust Cap metric type	£0.46

UHF COUPLER

PL258	Back to back female	£0.91
PL274	Back to back chassis	£1.07
SMCPL/PL	Back to back male	£1.38
M359	Elbow male-female	£1.07
M358	'T' 2 female 1 male	£1.38
M358AF	'T' 3 female	£1.70
M458	'X' 3 female 1 male	£2.13

UHF INTERSERIES ADAPTORS

UG255	UHF socket—BNC plug	£1.76
UG273	UHF plug—BNC socket	£1.76
S0/25	UHF socket—2.5mm jack	TOS
S0/35	UHF socket—3.5mm jack	£0.79
S0/NF	UHF socket—N socket	£1.96
UG146	UHF socket—N plug	£2.25
UG83	UHF plug—N socket	£1.96

UHF CABLES

PL36PL	3.0' RG58 PL259 ends	£1.85

N PLUG 50 ohms

UG536	Small type 5.5mm	£1.66
UG21	Standard type 11.2mm	£1.89
L42W	For LDF2/50 Heliax	£8.51
L44W	For LDF4/50 Heliax	£12.42

N SOCKET 50 ohms

UG58	Standard 4 hole fix	£1.12
UG1052	Free cable end 5.5mm	£2.12
UG23	Free cable end 11mm	£1.70
L42N	Free jack for LDF2/50	£8.51
L44N	Free jack for LDF4/50	£12.42
MX913C	Dust cap c/w chain	£0.46

N COUPLER 50 ohms

UG107	'T' 2 female 1 male	£3.74
UG28	'T' 3 female	£3.16
UG57	Double male adaptor	£2.70
UG29	Double female adaptor	£2.13
UG27	Elbow male-female	£2.24

N INTERSERIES ADAPTORS 50 ohms

UG201	N plug—BNC socket	£3.28
UG349	N socket—BNC plug	£3.16
UG606	N socket—BNC socket	£2.59
UG146	N plug—UHF socket	£2.25
UG83	N socket—UHF plug	£1.96
S0/NF	N socket—UHF socket	£1.96

NB: PRICES INCLUDE VAT AT 15%
Postage: £0.50 any quantity (UK)

HANSEN

IN LINE POWER/SWR BRIDGES P.E.P., R.M.S. 1·8–440MHz

The Hansen range covers 30 quality models with top-of-the-line the FS710. This is a flat frequency response, peak envelope power and average in-line wattmeter with many novel features. Notable being the 'power independent' SWR scale—no forward power calibration knob, just direct reading SWR.

FS710: PEP AUTO-SWR RMS LEVEL FS710 £89.70

FS710H: 1·8-60MHz. 20, 200, 2kW
FS710V: 50-150MHz. 20, 200W
V.S.W.R: 4:1 and to 20:1
Accuracy: ±7% of FSD
Impedance: 50·52 Ohms
Connectors: SO239
Power: 240 Volts AC 50Hz
Weight: 3·lbs (1·5Kgs)
Size overall: 8 × 4 × 5¼"
Size Meter: 2 × 3¼"
Time Const: PEP follow 4 second

FS500 £69.75

PEAK READING LEVEL RESPONSE
FS500H 1·8-60MHz 20, 200 & 2kW
FS500V 50 150MHz 20 & 200W
Power ±7% FSD. SWR 1:1 5:1
Size: 8 × 4 × 5¼"

FS600 £51.35

PEAK READING LEVEL RESPONSE
FS601M 1·8 30MHz 20 & 200W
FS601MH 1·8 30MHz 200 & 2kW
FS602M 50 150MHz 20 & 200W
FS603M 430 440MHz 5 & 20W
Power ±10% FSD. SWR 1:1 3:1
Size: 6¼ × 2¼ × 4¼"

FS300 £46.40

LEVEL RESPONSE, LARGE METER
FS300H 1·8MHz 20, 200 1kW.
FS300V 50 150MHz 20, 200W FSD
Power ±10% SWR 1:1 3:1 ±10%
Size: 8 × 4 × 5¼"

FS7 £41.00

VHF/UHF WATTMETER & BRIDGE
FS7 145MHz & 432MHz 5, 20, 200W
Power average ±10%. SWR 1:1-3:1
Power Max: 144MHz, 200W
432MHz 20W
Size: 6¼ × 2¼ × 4¼". 'N' type sockets

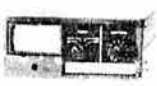
FS711 £36.80

REMOTE INDICATOR TYPE
FS711H 1·8-30MHz 20 & 200W
FS711V 50-150MHz 20 & 200W
FS711U 430-440MHz 5 & 20W
Power ±10% SWR 1:1-3:1 ±3%
Indicator 5 × 2½ × 1½"
coupler 3½ × 2½ × 1¼"

FS5E £37.20

INDEPENDENT TWIN METER
FS5E 3·5 150MHz 20, 200 & 1kW
Power average ±10%. SWR 1:1-5:1
Power Max: 1kW 3·5 30MHz
50W 50 150MHz
Size: 7 × 3 × 3½". 'On the Air' LED

FS300M £35.65



LEVEL RESPONSE, POWER & SWR
FS301M 1·8 30MHz 20, 200W
FS301MH 1·8 30MHz 200, 2kW
FS302M 50 150MHz 20, 200W
Power ±10%. SWR 1:1 3:1 ±3%
Size: 6¼ × 2¼ × 4¼"

SWR3S £26.45

WIDE RANGE POWER & SWR
SWR3S 3·5 150MHz 20 & 200W
Power average ±10%. SWR 1:1-3:1
Power Max: 200W 3·5 30MHz
50W 50 150MHz
Size: 6 × 2¼ × 2½". Antenna/switch

SWR50B £26.45

TWIN METER, RELATIVE POWER
SWR50B 3·5 150MHz Scaled 1kW
Power average ±20% SWR 1:1-3:1
Power Max: HF 1kW 1:1. 300W 3:1,
VHF 50W
Size: 6 × 2¼ × 2½". 'On the Air' LED

8 new models in stock. Sae for details

NB· PRICES INCLUDE VAT AT 15%
Carriage free (surface post) worldwide

SMC-HS

HF, VHF, UHF ANTENNAS MOBILE VERTICALS

SMC-HS Mobile Elements, tabulated below, feature an inbuilt PL259M connector, which mates with the SO239M on any of the four standard mounts. This arrangement is ideal for easy removal—band changes, comparative test, car wash, and anti-vandal, system checks from the feed point, portable operation and for ease of garaging etc. All models have fold over bases (either lift and lay or locking collar) except the 78B which has an inbuilt ball in case the mount must be fitted askew.

Model	Band	Gain	Type	Power	Length	Price
20SE	20m		(½λ)	100W	1·72m	£17.65
17SE	17m		(½λ)	200W	1·92m	£15.70
15SE	15m		(½λ)	130W	1·72m	£14.55
12SE	12m		(½λ)	200W	1·92m	£14.20
10SE	10m		(½λ)	100W	1·72m	£13.80
4E	4m	0dB	¼λ	150W	1·03m	£7.65
2H/PL	2m		(½λ)	50W	0·17m	£3.45
2QW	2m	0dB	¼λ	200W	0·49m	£2.30
2VF	2m	3dB	½λ	50W	1·06m	£11.50
2NE	2m	3dB	½λ	150W	1·30m	£6.90
78SF	2m		(½λ)	100W	1·42m	£13.80
78F	2m	4·5dB	¼λ	100W	1·75m	£13.80
78B	2m	4·5dB	¼λ	150W	1·72m	£13.80
88F	2m	5·2m	¼λ	100W	2.03m	£18.80
70N2M	2/70	2·7dB 5·1dB	(½λ) 2 × ½λ	100w	0·89m	£16.85
258	70cm	5·5dB	2 × ½λ	100W	0.91m	£12.65
358	70cm	6·3dB	3 × ½λ	100W	1·36m	£16.85

Model	Description	Price
SOWM	Wing Mount. SO239M upper SO239 under adjustable angle	£4.20
TMCAS	Boot Mount c/w 6 mtrs RG58 and PL259 plug	£8.45
GCCA	Gutter Mount deluxe cast type c/w 4 mtrs cable assemble and PL259	£9.95
SOMM	Mag Mount c/w 4 mtrs RG58 PL259 *For use with smaller antennas only*	£9.95

An alternative mounting for any of the two metre antennas listed above is the BSD stainless steel bumper strap at **£8.80** plus the HS88BK extension tube at **£18.80** which raises by 80 cms and acts as a counterpoise to the radiator.

Also fitting the bumper mount is the 10 foot, 3 section (quick disconnect and fold over jointed) mobile colinear element which provides about 7dB of gain for **£29.90.**

Stop press: ⅝λ ultra low radiation angle, typ. 30° below ⅝λ. Substantial improvement on DX (in clear).

For operation on 2 metres and 70 cms the dual band 70N2M is an elegant solution particularly when combined with the HS770 diplexer which provides 50W power handling, 30dB isolation between transceivers with an insertion loss of only 0·5dB for **£15.35.**

NB: PRICES INCLUDE VAT AT 15%
Mainland delivery: accs. £0.80, antennas £1.80

S. M. HOUSE, RUMBRIDGE STREET, TOTTON, SOUTHAMPTON SO4 4DP, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton
See preceding pages for complete addresses and phone numbers

COUNCIL

President
D. E. Baptiste, CBE

Executive vice-President
R. G. Barrett, GW8HEZ

Immediate past-President
E. J. Allaway, MB, ChB, MRCS, LRCP, G3FKM

Honorary treasurer
P. F. D. Cornish, FCA, G3COR

Ordinary members
J. Bazley, G3HCT
K. A. M. Fisher, TEng(CEI), MIPRE, G3WSN
G. Griffiths, BA, CEng, G3STG (co-opted 15/1/83)
H. M. Holmden, G4KCC
G. R. Jessop, CEng, MIERE, G6JP
T. I. Lundegard, G3GJW
D. M. Pratt, BEng, CEng, MIEE, MIERE, G3KEP
K. E. V. Willis, BSc, ARCS, CEng, MIEE, G8VR

Zonal members
Zone A. J. Heathershaw, G4CHH (Mrs)
Zone B. H. S. Pinchin, BSc, MBIM, G3VPE
Zone C. W. J. McClintock, MSc, G3VPK
Zone D. L. Hawkyard, G5HD
Zone E. R. G. Barrett, GW8HEZ
Zone F. I. J. Kyle, GI8AYZ
Zone G. F. Hall, GM8BZX

REGIONAL REPRESENTATIVES

Region 1—W. R. Parkinson, G3FNM. Tel 061-973 1472
Region 2—D. S. Smith, G4DAX. Tel 0947 86333
Region 3—L. W. Craven, G4EQI
Region 4—M. Shardlow, G3SZJ. Tel 0332 556875
Region 5—J. S. Allen, G3DOT
Region 6—F. S. G. Rose, G2DRT. Tel 0494 814240
Region 7—*(Post vacant)*
Region 8—K. A. Crouch, G8KEN. Tel 0303 55241
Region 9—W. J. Colclough, G3XC. Tel 0726 860485
Region 10—*(Post vacant)*
Region 11—B. H. Green, GW2FLZ. Tel 0492 49288
Region 12—M. R. Hobson, GM8KPH. Tel 0796 2140
Region 13—A. B. Givens, GM3YOR
Region 14—V. Kusin, GM4HCO
Region 15—J. T. Barnes, GI3USS. Tel 0247 3948
Region 16—T. D. Howe, G3PLF. Tel 0268 24453
Region 17—H. G. Cunningham, G8FG. Tel 0202 876018
Region 18—W. Ricalton, G4ADD. Tel 067 088 259
Region 19—R. J. Broadbent, G3AAJ
Region 20—B. L. Goddard, G4FRG

HONORARY OFFICERS

Aerial Planning Panel co-ordinator—c/o Membership services officer, RSGB HQ
Audio Visual Library co-ordinator—R. G. Auckland, G2PA
Awards managers—hf—P. Miles, G3KDB
vhf—Jack Hum, G5UM
HF manager—E. J. Allaway, G3FKM
Intruder Watch organizer—S. Cook, G5XB
Microwave manager—D. S. Evans, G3RPE
Observation Service organizer—D. M. Pratt, G3KEP
Slow morse practice transmissions organizer—M. A. C. MacBrayne, G3KGU
Trophies manager—P. A. Miles, G3KDB
VHF manager—K. A. M. Fisher, G3WSN

Correspondence to RRs and honorary officers should be addressed directly to them (QTHR), not to RSGB HQ.

RSGB QSL BUREAU

QSL cards for distribution should be sent to:
Mr E. G. Allen, G3DRN, QSL Bureau manager, 30 Bodnant Gardens, London SW20 0UD

A list of QSL Bureau sub-managers was published in the January 1983 issue, and amendments appear under "QTC" in this and the February and March issues.

ANNUAL SUBSCRIPTION RATES

UK corporate: £14.50, incl VAT.
Overseas: £14.50.
Associates under 18: £5.80.
Family member: £5.80.
Students age 18 to 25: £8.70 *(Applications should give the applicant's age at last renewal date and include evidence of student status).*
Affiliated societies: £14.50 (including *Rad Com*); **£8.70** (excluding *Rad Com*).

RADIO SOCIETY OF GREAT BRITAIN

(Limited by guarantee)

Registered office

Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW

Telephone (Dialling code 77 from London, 0707 from outside London) 59015. Telex 25280 (RSGBHQ G)

Founded 1913. Incorporated 1926. Member society, International Amateur Radio Union

PATRON: HRH The Prince Philip, Duke of Edinburgh, KG

The national society representing all UK radio amateurs

Membership is open to all those with an active interest in radio experimentation and communication as a hobby. Applications for membership should be made to the general manager, from whom full details of Society services may also be obtained.

GENERAL MANAGER AND SECRETARY
D. A. Evans, G3OUF

EDITOR
A. W. Hutchinson

RSGB HEADLINE NEWS—Tel 0707 59312

By telephoning the above number, members can receive up-to-date amateur radio news of immediate interest from a three-minute recording. This is generally updated twice or more weekly.

RSGB SUNDAY NEWS BROADCASTS

These broadcasts are made every Sunday morning, giving almost complete coverage of the British Isles. Stations broadcasting them (particulars below) use the callsign GB2RS.

The purpose of these news broadcasts is to provide an outlet for amateur radio news items which cannot wait for the next issue of *Rad Com.* Items for inclusion should reach RSGB HQ by letter (marked "GB2RS news") or telephone 0707 59260 before 10am on Wednesdays, although no guarantee of inclusion can be given. Once broadcast, items are not usually repeated.

INTENDED RECEPTION AREA	NORMAL READER	RESERVE READER	LOCAL START TIME
Frequency: 3·640MHz. Mode: ssb			
NE Scotland	GM3HGA	GM3VEY	1130
Frequency: 3·650MHz. Mode: ssb			
SE England	G2MI	G4ARZ	0900
Midlands	G2CVV	G8QZ	0930
SW England/Wales	G8ML	G3JFH/G4IEY	1000
Northern Ireland	GI3GAL	GI3SXG	1030
NE England	G5VO	G3MCF	1100
E Scotland	GM4CUZ	GM4FLP	1430
Midlands	G8QZ	G2CVV/G3SZJ	1800
Frequency: 3·660MHz. Mode: ssb			
Central Scotland	GM3TCW	GM3ULP	1130
Frequency: 7·0475MHz. Mode: a.m.			
UK (from Northern Ireland)	GI3GGY	GI2DHB	0900
UK (from N Midlands)	G3LEQ	G2CVV	1100
Frequency: 144·250MHz. Mode: ssb (horizontal polarization)			
N from Carlisle	G4LAA	(Vacancy)	0930
SW from the Midlands	G3BA	G3KQF	0930
NE from S Devon	G3CHN	G3PBV	1000
NW from Manchester	G3SMT	G3SMM	1000
NNW from Cleveland	G4JJB	G8FTZ	1000
W from Carlisle	G4LAA	(Vacancy)	1030
SE from Lincoln	G3NRO	G8ZVF	1030
SW from London	G3FZL/G3VAG	G3IIR	1030
S from Aberdeen	GM8GHV	GM8MBP	1030
W from Bristol	G4CJZ	G3ZWY	1100
NE from Cambridge	G8HVV	G8BBK	1100
W from Bangor, Co Down	GI3TLT	GI3SXG	1130
Frequency: 145·525MHz (S21). Mode: fm (vertical polarization)			
Caithness	GM4KNQ	GM4LNN	0930
Cornwall	G2ABC	G3NPB	0930
North Hampshire	G8CKN	G3PZN	0930
Suffolk	G3ZNU	G4FZZ/G4HMF	0930
Leeds	G3SPX	G8XGN	0930
Co Down	GI3WEM	GI4DOR	0930
Edinburgh	GM4EHO	(Vacancy)	0930
E Cornwall/S Devon	G3ZYY	G8XTE	1000
Londonderry	GI2DHB	GI4AHD	1000
London	G3FZL/G3VAG	G3IIR	1000
Birmingham	G3BA	G4LCM	1000
Lincolnshire	G3NRO	G8ZVF	1000
Tyneside	G4LDT	G8TKU	1000
Glasgow	GM4HCO	GM4CXM	1000
Elgin	GM4ILS	(Vacancy)	1000
Southampton	G8LVC	G4COM/G4IDV	1030
E Sussex coast	G8SC	G3ZFE	1030
Bristol	G4CJZ	G3ZWY/G8NNU	1030
Cambridge	G8HVV	G8BBK	1030
Manchester	G3LEQ	G3JWK	1030
Dumfries	GM3MSG	(Vacancy)	1100
Brighton coast	G3ZYE	G8GEZ	1100
Preston	G8WAT	(Vacancy)	1100
Huntingdon, Cambs	(Vacancy)	G8TQI	1100
Jersey	GJ4JWA	GJ8YVL	1100
Porthmadog, Gwynedd	GW6CGR	GW6ARL/GW3KJW	1100
Clwyd/Merseyside	GW4IEQ	G8NNS	1100
W Glamorgan/N Devon	GW8VHI	GW3VPL/GW8TVX	1100
Aberystwyth	GW4JXB	GW8MAW	1130
Exeter	G3PBV	G4PCB	1130
Leicester	G4JYS	G4EYL	1130
Scarborough	G4OSD	G4EEV	1130
Enniskillen	GI4PCY	GI4CZW	1230

CURRENT COMMENT

Emergency communications

Thankfully the UK does not tend to suffer from a large number of natural or man-made disasters. However, when they do occur it is in the best interests of everyone that Raynet is properly trained, tested and free to provide emergency communication facilities as required. Given that disasters are infrequent in this country, it is essential that Raynet groups are able to practice with the various user services. This is valuable and important for a number of reasons: good liaison between Raynet and the user services takes place at county level, together with the opportunities for Raynet to hone its skills in practice in a professional environment. Both of these act as a valuable stimulus to morale (since there is nothing worse than being a member of a group without a task in life—sitting around doing nothing and feeling unwanted is not conducive to good performance under stress) and also provide a means by which amateur radio can be seen to be assisting the community.

Some years ago, the Home Office accepted the Raynet case for practice and liaison, and agreed that some level of both was desirable. They stated that county shows and similar events could be utilised for exercise purposes. However, there was a difficulty, insofar as events of this nature are not frequently held in some counties, and charity walks, marathons and similar situations thus found favour with Raynet and the user services. The Home Office, however, did not consider that the latter type of event fell within the ambit of their initial agreement, and it has taken a considerable time to convince them that the increase in the level of Raynet practice which would be implied by the inclusion of the latter event categories is necessary. The RSGB has stressed that real emergency situations are very infrequent, and that practice must, in consequence, be as frequent and realistic as possible and the other facilities available to the emergency services have also been discussed—all of these things have been taken into account and have resulted in the recent changes in the facilities available to Raynet.

Since such a positive step forward has been taken, enabling the scope of Raynet's coverage of events to be much wider, it now becomes the responsibility of individual groups to get the best out of the new concessions. The Raynet Committee is always available to give assistance and advice, and groups should not hesitate to ask for help from it if they so wish.

After the announcement of the new facilities (*Rad Com* February 1983), several comments and queries were received, and the main points have been distilled into these notes.

Q. What does one exercise per month mean?

A. For purposes of practice and for good liaison with user services, the Home Office has agreed that any type of exercise may now take place. This includes marathons etc, but excludes those related to civil defence—see later. The only limitation, which has been made for reasons connected with usage of the amateur radio spectrum, is that each group may hold an exercise where they pass messages for any of the user services only once per calendar month. Exercises may not be held over or accumulated. It is appreciated that this is more restrictive than some would have liked: however, it is hoped that the unlimited scope of activities now possible will compensate for this.

Q. Are internal Raynet exercises permitted?

A. Internal exercises involving the passing of third-party messages are not permitted, but the Home Office has confirmed, however, that routine practice exercises *can* take place, provided that these conform in all respects to licensing conditions. This has, of course, always been the case and has never previously inhibited internal practice Raynet exercises.

Q. Have civil defence exercises been cleared yet?

A. No. The Home Office and the Ministry of Defence are still discussing this aspect of Raynet operations, and it is hoped that this matter will be resolved soon, so that civil defence related exercises should not be entertained by groups at present. This is, in fact, the only exception to the situation whereby any type of exercise in conjunction with a user service is now permitted. Special permission has been given in the past for Raynet participation in national civil defence exercises, and the Society believes that such permission will continue to be given prior to any future "blanket" agreement which may be made.

Q. Does not the agreement regarding the use of amateur radio in an emergency—for instance, at a road traffic accident—merely give official blessing to what has always been the practice anyway?

A. Yes—although in fact it has been uncommon for amateur radio to be used to advise the emergency services of an incident, there have been a few occasions when the amateur service has been utilized for such traffic. The ITU recognizes the special value of amateur radio under disaster conditions, and there have been many instances of natural disasters (earthquakes, floods, hurricanes etc) where the use of the amateur service has proved essential for prompt relief, but the "natural disaster" scenario is, mercifully, not common in the UK. The Home Office has now considered the general question of amateur radio under emergency conditions such as in the example of a road traffic accident mentioned above, and has appreciated its value: hence the new concessions to be included in the amateur licence.

Q. What activity is now regarded as an "exercise"?

A. Any activity which is NOT a real emergency, in the sense of an incident such as a railway accident or a flood during which one of the specified user services calls on Raynet for assistance. Anything else now falls under the rather generalized heading of "Exercise". Raynet is now able to participate in any type of event—from the RAC rally to the local egg-and-spoon race—if it wishes, at the request of a user service. The fact that these events might lead to a situation in which medical advice may be required, for example, does not mean that the "exercise" suddenly becomes an "emergency" unless, because of the situation, the user service treats it as one. In other words, an exercise must not be regarded as a potential emergency; should the user service decide that the situation has become an emergency, Raynet should treat it as such from then on.

Q. Who is classed as a "responsible person", and when can they use the microphone?

A. It is a matter for the individual amateur to determine who is a "responsible person", bearing in mind the particular circumstances at the time, but generally speaking this could apply to user service personnel (ie a police officer), a doctor or any other responsible person on the scene at the time, such as the pilot of a rescue helicopter. However, this facility for third-party use of the microphone is available ONLY during actual emergencies—at all other times the normal conditions of the amateur licence apply. □

A message from the new ITU secretary-general to radio amateurs

On the eve of World Telecommunications Year, Richard E. Butler, secretary-general-elect of the ITU, had the following words to say about radio amateurs:

"At the moment that I take office as secretary-general of the International Telecommunications Union, and at the beginning of World Telecommunications Year 1983, I have pleasure in sending a message of goodwill to all amateur radio enthusiasts throughout the world.

"The pioneers of amateur radio distinguished themselves by opening up the frequency bands now in daily use for broadcasting and commercial radio services and thus made a memorable contribution towards technical progress. You have been called upon, in times of disaster such as floods, earthquakes, fires, hurricanes and epidemics, to play a humanitarian role in mobilizing help and saving lives. Radio amateurs have not only adapted themselves to technical progress but have often been its forerunners.

"The rapid growth and worldwide diffusion of technological change and its application to all aspects of life, coupled with the rising expectations of all peoples to secure material well-being, makes it certain that international order will remain at risk if the distribution of the benefits of technological resources is not continuously the subject of international decision-making. Radio amateurs have of course the opportunity to contribute to the decision making process at international level, either through the respective telecommunications administration or through IARU. I also appreciate that amateur radio is, above all, a fascinating educational activity whose universality fosters friendship, goodwill, technical know-how, technical assistance for developing countries and greater understanding among peoples all over the world.

"The recent ITU Plenipotentiary Conference, held in Nairobi in 1982, has once again recalled the vital importance of all telecommunications

services for social and economic development and the achievement of a new world information and communication order. The conference hailed the designation of 1983 as World Communications Year. In proclaiming the Year, the United Nations General Assembly sought to encourage the in-depth examination and analysis of national communications development policies and the accelerated development of communications infrastructures. The Nairobi Conference decided also to establish during World Communications Year 1983 an independent 'International Commission for Worldwide Telecommunications Development' to be composed of representatives of the highest decision-making authorities with specific terms of reference to examine and recommend a range of methods both tried and untried 'for stimulating telecommunications development in the developing world using appropriate and proven technologies' leading to 'progressive achievement of self reliance . . . and the narrowing of the gap between the developing and developed countries'.

"The coming years will be years of innovation and dialogue between all partners in the world of telecommunications, including radio amateurs—a meaningful, realistic dialogue that should take account of the needs of all. Thus, as 1983 opens, I am confident that radio amateurs all over the world will actively contribute to the success of World Communications Year—development of communications infrastructures—either through participation in projects and events of national amateur radio societies, the national WCY committees, through IARU, and finally through the World Communications Year Secretariat at ITU headquarters, I wish you all a successful World Communications Year 1983." □

QTC
Amateur radio news

QSL Bureau

The following sub-managers have been appointed for the remaining G4 callsign series:

G4UAA-UZZ series. Mr P. Godfrey, G8ULU, 38 The Halt, Whitstable, Kent CT5 3EQ.

G4VAA-VZZ series. Mr R. C. Powell, G8XHM, 11 North Park, Fakenham, Norfolk NR21 9RG.

G4WAA-WZZ series. Mr L. Gaunt, G4MLV, 31 Moat Hill, Birstall, Batley, West Yorks WF17 0DX.

G4XAA-XZZ series. Mr S. R. Tyler, G8YGP, 2 John Court, Hoddesdon, Herts EN11 9LZ.

G4YAA-YZZ series. Mrs I. Rabbitts, RS42676, 1 Simmons Way, London N20 0TH.

G4ZAA-ZZZ series. Mr J. Densem, G4KJV, Cotswold, Startley, Chippenham, Wilts SN15 5HG.

"HF predictions on the home computer"

The authors of this article, published in *Rad Com* March 1983, advise the following amendment: T1 in lines 1150 and 1160 of the program should read T1(N). This will have minimal effect for routes terminating in the UK. However, some computers complain when variables are called when they have not previously been defined.

"An audio swr meter"

The authors of this article, published in *Rad Com* January 1982, advise the following amendments: (a) on the Veroboard layout there should be a link from X22 to T22; (b) R15 should be 100kΩ preset to allow for adjustment of the o/p tone.

Morse test vetting procedures

The Home Office advises that *not without some reluctance* new vetting procedures are to be introduced forthwith for all candidates sitting the amateur morse test. In future all candidates will be required to show a valid passport or produce some other positive means of identification to the satisfaction of the examiner. The morse test application form is being revised to take account of this change.

RSGB REGION 19 ORM

Sunday 8 May 1983 commencing at 2pm

at

The Ashmore Centre, Burleigh Gardens Southgate, London N14

(Two minutes walk from Southgate Underground Station)

All RSGB members are welcome, and each may bring a guest, to this, the first ORM in Region 19 for 16 years.

There will be a lecture entitled "Fully-computerized antenna rotator control systems for the radio amateur" by T. Stockhill, BSc, G4GPQ.

The Chair will be taken at 2pm prompt by Mr R. Broadbent, Region 19 representative. Members of the RSGB Council and of RSGB committees will be present to answer questions.

This ORM is long overdue and should bring an interesting response from the many new RSGB members in the region—London north of the Thames, and all Hertfordshire.

Further information can be obtained from G3AAJ, QTHR, or 01-989 6741 evenings and weekends, or from RSGB HQ.

Intruder Watch

The RSGB Intruder Watch would like to hear from any member with programming experience in computers using the 6502 cpu, to work with other members in devising listings and specifying peripherals for identifying data and printer systems other than ASCII and Baudot.

Anyone interested is asked to contact Mr S. Cook, G5XB, QTHR, the Intruder Watch organizer.

Yeovil ARC investigation of chordal hop propagation

Following G3MYM's chordal hop lecture at the club in December 1982, Yeovil ARC carried out an all-band search for chordal hop contacts at sunrise on 5 and 6 February 1983. BRS10663 was successful in identifying a 14MHz QSO which met the chordal hop criteria. Analysis of the data obtained in February has given G3MYM more specific ideas on the nature of chordal hop propagation, and further chordal hop tests are planned for June and October.

Technical help required by the British Talking Book Service for the Blind

Over 3,000 technical helpers at present look after "talking books" for the blind through Britain, but there are over 50,000 blind readers needing help

AMATEUR RADIO CONVENTION

9am to 5pm Sunday 24 April 1983

Restaurant area of The Plessey Co Ltd, Martin Road, West Leigh, Havant, Hampshire

Talk-in on S22 (145·550MHz) by GB8PWL

This convention is being organized by The Plessey West Leigh Radio Society, G3WLE, by kind permission of The Plessey Co Ltd, and the managing director Mr V. J. McMullan.

LECTURES (start at 10am)

"High power linear amplifiers", by P. Chadwick, G3RZP
"Computations on long Yagis", by I. F. White, G3SEK
"Moonbounce", by C. Suckling, G3WDG
"FM atv on 2·4 and 10GHz" by A. Wood, G4EEE
"Measurements on transceivers" by J. Delaney of Hewlett Packard Ltd

Seating for 250 **Ample free car parking space**
Bar and buffet 12 to 2pm
Admission 40p—proceeds to RAIBC

Further details from John Harwood, G3WLY (ext 257); Mick Curran, G4ITF (ext 335); or Andy Blagg, G4JXL (ext 232), all on Havant (0705) 486391.

BATC ATV EXHIBITION
at
The Post House, Leicester
Commencing 10am, Sunday 22 May 1983

Attractions will include the British Amateur Television Club's outside broadcast unit, and demonstrations of both fast- and slow-scan and narrow-bandwidth television. In addition to trade stands, a comprehensive range of BATC books and pcbs for projects in *Amateur Television Handbook 2* will be on sale.

The Post House Hotel is well-suited to family needs and provides a reasonably-priced Sunday lunch, not to mention the bar. Accommodation for those attending the exhibition will be available at a special price.

—4,300 of them are over 90, and as many as 150 are over 100 years old. Despite the large number of helpers, there are still some 40 areas throughout the country that are desperate for more. The volunteer helpers come from a wide range of technically trained electrical or electronic engineers, and each one is able to look after up to 10 or more blind people—to visit them when required and to assist in repairing generally minor defects in their sets.

Would you be prepared to give up some of your time for this work? The time involved in looking after six or seven blind people probably does not exceed about one hour per month.

The blind people have tape reading cassette-type playback units and are supplied with tapes from a large library in London. Help is needed to install these, initially by fitting a plug and by giving some guidance to the blind people, whose average age is over 70 and many of whom are very poor. The fullest technical details are sent out to each helper, but should the circuitry present a problem then headquarters is, of course, always available to assist.

Anyone prepared to assist or who would like further details is asked to write to Mr D Finlay-Maxwell, MIEE, FTI, G3BGA, Hon Organizer Voluntary Helpers, c/o John Gladstone & Co Ltd, Wellington Mills, Huddersfield HD3 3HJ.

DLT '83, 29 April-1 May 1983

The Netherlands national amateur radio society VERON, in co-operation with the Belgian (UBA) and West German (DARC) national societies is organizing this DLT—Drie Landen Treffen (Three Countries Meeting)—which will take place at the De Dousberg site in Maastricht in Holland. The site, which is located near the Belgian border and is easily reached from Aachen, W Germany, provides modern camping facilities, which include both indoor and outdoor swimming pools and tennis courts, and because of its height is ideal for vhf.

Among the attractions during the event will be a flea market, trade stands, an all-band amateur radio station which will be on the air continuously, guest licences provided on the spot, computer demonstrations, amateur television demonstrations, lectures, films and slides, contests, diy exhibition, and information stands by VERON, UBA, DARC, DYLC, SWL and others. In co-operation with the tourist organization in Maastricht, a sightseeing tour of the town has been arranged, and a children's nursery will be available.

To celebrate the birthday of Queen Beatrix of the Netherlands on 30 April many additional activities, including a fireworks display, will take place in Maastricht during DLT '83.

For camping reservations contact: E. F. M. Maertens, PD0FFU, Peter Gielenstraat 5, 6217 GJ Maastricht, The Netherlands; tel 043-76836. For hotel accommodation contact the tourist office in Maastricht: V. V. V. Maastricht, Vissersmaas 4/b, 6211 EV Maastricht, The Netherlands; tel 043-19363. Other correspondence should be addressed to R. D. M. Kemperman, PE1ILB, Handvorm 2, 6372 DJ Schaesberg, The Netherlands; tel 045-317828.

A special award has been designed for DLT '83, details of which can be obtained from PD0FFU (address above).

South Cotswold ARS

This new club was formed in October 1982 by a nucleus of 10 members which has now grown to a membership of over 30. Meetings take place on the second and fourth Wednesdays of each month at the Scout HQ, Dr Browns Road, Minchinhampton. New members will be welcome, and further information can be obtained from the club chairman Mr R. J. Burnett, G4RJB, tel Nailsworth 2874.

Stolen equipment

From a car in the Coventry area on 3 February 1983: Yaesu FT290R, serial number 2K190335. Information to G6PRN, 21 St Peter's Close, Henley, Ipswich IP6 0RH.

For "golden" read "diamond"

Our apologies to Mr L. H. Lee, G5FH, for the error on page 220 of *Rad Com* March 1983: the jubilee was inadvertently "devalued" by 10 years.

Council Letter

The following issues have been published this year and circulated to RSGB Council members, regional and area represenatives, and other volunteers, for dissemination:

Vol 6 No 1, 27 January 1983.
Vol 6 No 2, 25 February 1983.

A MODERN HF TRANSCEIVER

(PART 1)

by G. N. FARE, G3OGQ*

Introduction

The advent of ssb, because of its complexity, has been blamed by many amateurs for the decline in home construction. Shortly after that, the introduction of transceivers made home construction appear to be beyond the capabilities of the average amateur. Thanks, however, to Plessey, and in particular to G3ZVC and G4CLF, it is possible to produce the "difficult" parts, ie the ssb exciter and receiver i.f. strip, quite easily, and there is no reason today why the average experienced amateur should not build his own.

The transceiver presented here is comparatively easy to construct and tune, and uses readily-available (ie no junk-box or rare ic) components. It is completely solidstate and incorporates rit, adjustable cw break-in, digital frequency readout, effective alc with vswr protection of the final amplifier, is broadband, requires no tuning apart from the vfo, and possesses a sensitive receiver and excellent-sounding transmitter.

Some may question the decision to limit the range of the transceiver to 3·5 and 14MHz but it must be remembered that 14MHz carries the bulk of dx traffic, and 3·5MHz provides more local contacts. The saving in cost and complexity is considerable, and as a spin-off, the amateur is encouraged to erect no-compromise antennas. The power output is sufficient to provide excellent coverage under normal propagation conditions but, if necessary, is also sufficient to drive the average "1kW" linear amplifier to the legal limit. It is not, however, a beginner's project, and should not be attempted unless the constructor is confident of his ability to solder properly and can follow a circuit diagram with sufficient ease to be able to trouble-shoot any faults occurring during construction.

The transceiver incorporates many of the features to be found in commercial transceivers, and it is possible to construct a basic model omitting these features but which will function just as well at the sacrifice of some operating convenience. For example, the digital readout can be omitted and replaced by an analogue dial and pointer. CW break-in could be omitted entirely, using the push-to-talk switch instead. The alc circuit could be omitted if care were taken with the loading etc, and the manual drive control could be used instead. It is also possible to take the output from the driver and have a QRP transmitter, and finally the unit could be built as a single-band transceiver by omitting the unwanted filters and switching.

A transceiver like this would get you on the air at minimal cost, and the extras could be added at a later date as funds allowed.

*Cobblestones, Walton Old Hall, Walton, Warrington, Cheshire.

Block diagram (Fig 1)

On receive, the incoming signal is routed through a separate bandpass filter for each band, and passed direct to the mixer on a modified G4CLF Plessey receiver and transmitter exciter. A vfo operating at 5 to 5·5MHz is mixed with the incoming signal to produce a sum or difference frequency, depending on the band, of 9MHz. This signal is amplified and mixed in a balanced modulator fed with a carrier oscillator for each sideband. The af output is 2W. AGC is audio-derived and applied to the i.f. amplifiers. The S-meter is driven from the age line.

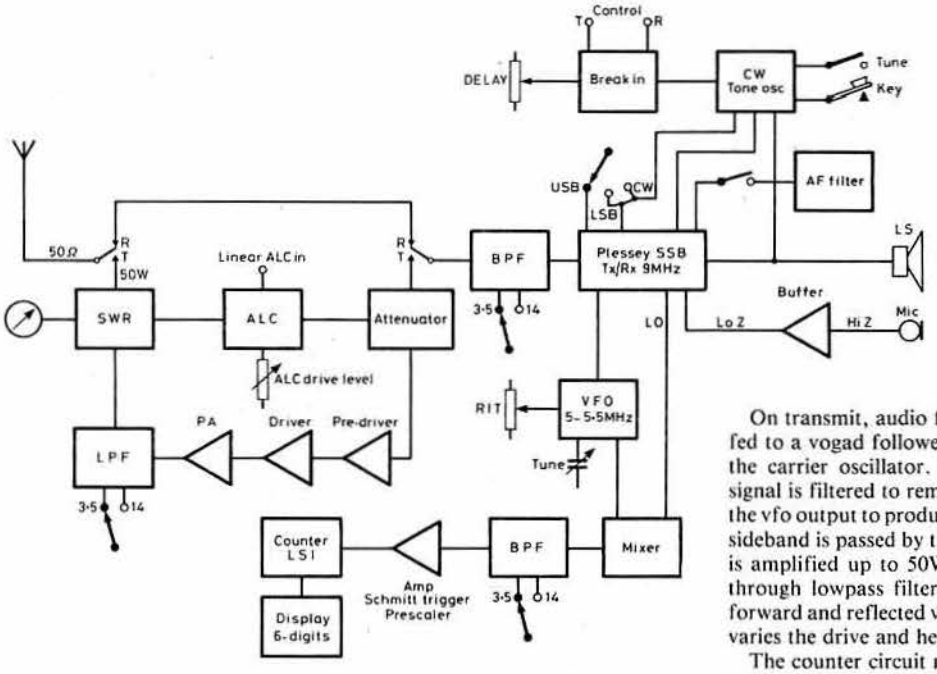


Fig 1. Transceiver block diagram

On transmit, audio from a high impedance microphone is matched and fed to a vogad followed by a balanced modulator, where it is mixed with the carrier oscillator. The resultant double-sideband-suppressed carrier signal is filtered to remove the unwanted sideband and is then mixed with the vfo output to produce a sum or difference of 3·5 or 14MHz. The wanted sideband is passed by the bandpass filters to a p.i.n. diode attenuator, and is amplified up to 50W in a three-stage amplifier. The output is routed through lowpass filters to a wattmeter which drives a vswr meter, and forward and reflected voltages are summed to produce an alc voltage which varies the drive and hence the output of the amplifier.

The counter circuit mixes the vfo and carrier oscillator signals, and the sum or difference frequency, at 3·5 or 14MHz, is amplified, squared, prescaled and counted. The display reads down to 100Hz.

On cw a tone oscillator is keyed and the single tone is applied to the balanced modulator. The key also operates a break-in keying system which incorporates variable delay. The oscillator operates continuously when TUNE is selected.

Circuit details

The complete circuit of the transceiver is shown in Figs 2 and 3, and the psu in Fig 4, and these should be referred to when reading the following details. Construction will be much easier if it is understood how each part of the circuit works and how they fit together.

VFO

The vfo consists of a fet Colpitts oscillator which is tuned by an LC circuit. RIT is obtained by means of a varactor diode which has a constant voltage applied to it in transmit and a selectable variable voltage in receive. The frequency excursion is about ±5kHz. The oscillator signal is amplified by another fet and a bipolar transistor followed by a bandpass filter. The output is at 7dBm (0·5V rms) into the 50Ω port of the hot-carrier-diode ring mixer. The stability is better than ±100Hz after 30min warm-up.

Table 1. Specification and measured performance

GENERAL	
Frequency coverage	3·5 to 4MHz. 14·0 to 14·5MHz
Modes of operation	USB, lsb, cw
Frequency stability	Total drift ±100Hz after warm-up
Frequency readout	15ppm ±100Hz
Power requirements	13·6V. 0·5A receive. 7A transmit (Two-tone test)
Dimensions	Width 300mm, depth 260mm, height (excluding feet) 105mm
RECEIVER	
Sensitivity with 2·4kHz filter on ssb for 10dB s+n/n	0·3μV pd
AGC	Less than 3dB output change for 80dB input signal change, reference to agc threshold. Attack time, 5ms. Decay time, 1s
Selectivity (ssb)	2·4kHz at −6dB and 4·3kHz at −60dB (1·8:1 shape factor)
Two-tone dynamic range	95dB
IF frequency	9MHz
Image and i.f. rejection	Greater than 60dB
Audio output	2W
TRANSMITTER	
Power output ssb	3·5MHz 50W p.e.p.
(with alc operative)	14MHz 53W p.e.p.
Load impedance	50Ω
Harmonic output	Second harmonic −45dB Third harmonic −50dB
Third-order imd products	−33dB at 50W p.e.p. (−27dB below one of two tones)
Microphone input	High impedance
Attenuation with vswr	at 1:1 0% at 4:1 50% 2:1 10% 5:1 90% 3:1 25%

Bandpass filters

The bandpass filters consist of three-section T-filters, designed for 50Ω input and output. This means that for proper receiver operation it is essential that the antenna input be of 50Ω impedance. However, this problem should not arise in a transceiver, as the antenna should have this impedance in order to transmit properly. The receiver will work with any old bit of wire, but for best performance a 50Ω antenna is essential. The filter for each band is selected by means of p.i.n. diodes, as is the transmit/receive switching.

Mixer

The mixer consists of an MD108 or SBL-1 hot-carrier-diode ring which performs extremely well. To obtain the best results, the vfo injection must be at least +7dBm. Even better results can be obtained with a vfo injection of up to +12dBm, which is the largest signal the author has tried.

The fet amplifier following the mixer is switched in both directions for transmit and receive by means of p.i.n. diodes. This amplifier makes up the loss (about 7dB) sustained in the mixer, and is matched to the input of the filter by means of a toroidal transformer, T202.

Filter

The filter is the most important component in the receiver, as this determines the bandwidth and the unwanted sideband suppression. The one used by the author is an eight-pole filter with a bandwidth of 2·4kHz at −6dB and 4·3kHz at 60dB and was obtained from IQD, who advertise in this magazine. Other filters such as the XF9-B, QC1246AX of the same specification may be used if you have the extra money to spare, but this one is quite adequate. Carrier crystals are provided with the filter.

IF amplifier and demodulator

Following the filter are two i.f. amplifier stages consisting of Plessey SL1612 ics. These are agc controlled and are capable of a total voltage gain of 2,500 (68dB) up to 15MHz.

The agc range is 80dB, which is quite adequate. The balanced modulator is a Plessey SL1640, which produces the difference frequency between the i.f. signal and the carrier oscillator. A single fet carrier oscillator with switched crystals was tried first, but the circuit as shown gives a much better performance. The 9,001·5kHz crystal is used for lsb and cw, and the 8998·5kHz crystal for usb.

AGC

AGC is derived from the audio output of the SL1640 by means of a Plessey SL1621. The capacitors shown give a delay of about 1s. Longer time constants may be used, but the author is convinced that under normal operating conditions—for instance, when searching the band—1s is optimum. If used mostly for cw it would be preferable to switch the agc off, and this may be done by a switch which grounds the 100Ω resistors from pin 7 of the SL1612s and disconnects the agc line from the SL1621. The agc line is also used to give an S-meter indication which, while not completely linear, has proved quite satisfactory in operation.

AF amplifiers

The af amplifiers are straightforward, using a 741 and an LM380. The Zobell network on the output is not necessary if the speaker leads are short. The audio output is 2W. The LM380 is in circuit both in transmit and receive, and in transmit acts as a sidetone amplifier. It is possible to adjust the input so that incoming signals appear at the same strength as the sidetone, thus avoiding operator fatigue.

AF filter

The af filter consists of a two-pole RC active bandpass circuit which has a peak response at about 750Hz and a Q of 5. This filter, which is for cw use only, helps to reduce QRM and improves the signal to noise ratio.

The filter is inserted between the af preamplifier (IC205) and the audio gain control (R223), and is switched in or out from the front panel.

Transmitter

In transmit, the output of a high impedance microphone is matched by means of a fet buffer stage to the input of a vogad, SL6270. The buffer was introduced because most hf transceivers use high-impedance microphone inputs. The output from the cw tone oscillator is also applied to the vogad, and the microphone input is shorted when cw is selected.

The balanced modulator is an SL1640 which takes the audio signal from the vogad and mixes the carrier oscillator signal to produce a double-sideband suppressed-carrier output at 9MHz. This output is matched to the crystal filter by the BF441 transistor. The filter rejects the unwanted sideband, and the ssb signal is amplified by a fet amplifier which is switched by p.i.n. diodes. A toroidal transformer matches the output to the diode ring mixer where it is mixed with the vfo signal. The signal is then passed by means of diode switches through the appropriate filter. Further switching diodes pass the signal to a p.i.n. diode attenuator. In the absence of any alc voltage, the diode is forward biased and passes the signal with very little attenuation. The predriver consists of two transistor amplifiers operating in Class A with feedback to give an even amplification across both bands. T501, a toroidal transformer, matches the collector impedance of the first 2N3866 to the base impedance of the second.

The driver stage is also single ended and operates in Class A. T601 and

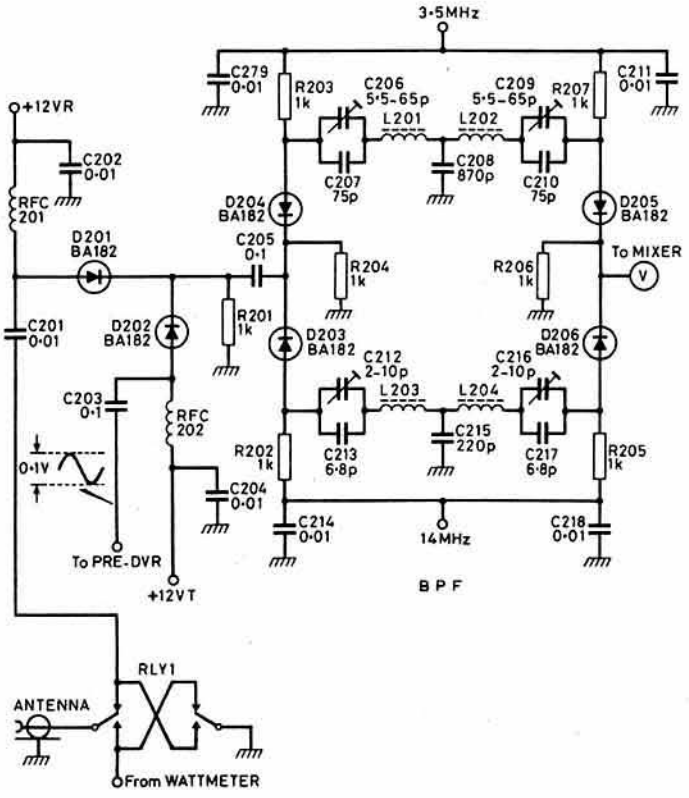


Fig 2 (a). Transceiver circuit diagram, part 1

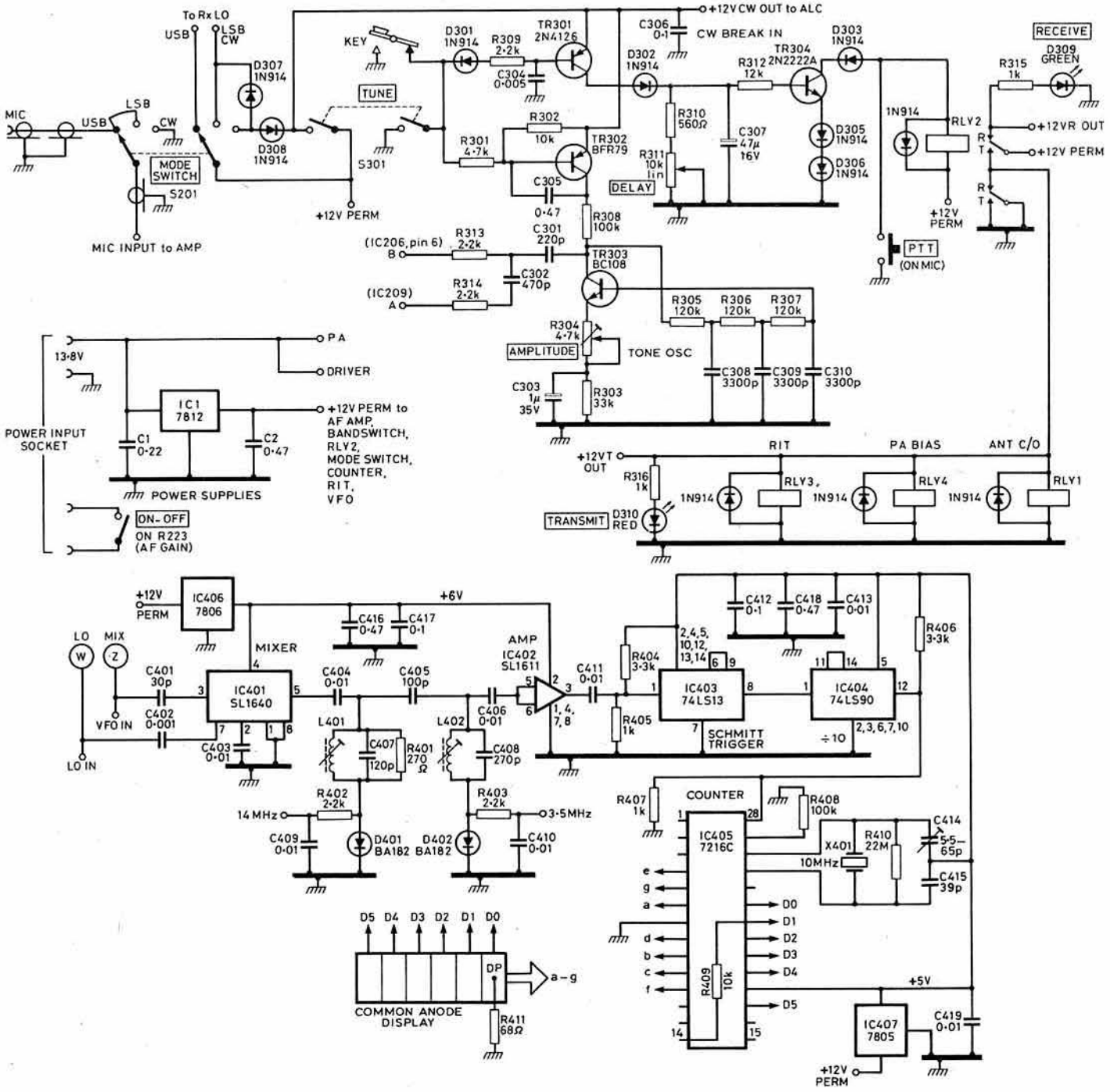


Fig 2 (b). Transceiver circuit diagram, part 2

T602 match the input and output. This stage is capable of 4W output, although only 1·5W is required to drive the pa to 50W. Note the use of generous decoupling.

The final amplifier is also broadbanded and is of standard design. A lot of rather high technological wizardry seems to surround the design of transistor power amplifiers which, together with the high cost of power transistors and the fear of many amateurs that they are somewhat fragile devices, has tended to discourage most amateurs from building them.

None of these arguments is correct. The cost of an MRF450A used in this amplifier is £11·50 (plus VAT), not much more than a valve costs today. Further, these devices are now far less fragile than they were and are capable of coping with a quite large vswr and overheating without being destroyed.

The amplifier described here is capable of at least 70W output, but the improvement in imd when the output is restricted to 50W so impressed the author that it was thought to be well worth the minor sacrifice. The third order imd products are 33dB down at 50W p.e.p output, second harmonic suppression is at least 45dB, and third harmonic suppression better than 50dB. These measurements were taken on 3·5MHz, and are better on 14MHz. The results are better than similar measurements taken on the author's expensive American transceiver.

The circuit is as follows. A 4:1 input matching transformer T701 is followed by the input correction networks consisting of the 3·3Ω resistors and 3,300pF capacitors. Bias is fed to the base of each transistor via the 10µH rf chokes and the 0·47Ω resistor. The two 6·8Ω resistors form the ground return path and provide base stabilization. The purpose of the 0·47Ω resistor is to ensure that sufficient current will remain in the biasing diodes under full base current. The gain of the MRF450 is about 20dB at 14MHz, and 25dB at 4MHz, and the input gain compensation networks and negative feedback are used to provide an almost flat frequency response for both bands. Because of the large excursion in collector current, the base current can vary from less than 5mA to about 250mA peak during ssb operation. It is essential that the bias voltage is held to within 0·1V during this excursion, and this is provided by three diodes in parallel acting as a zener diode which is heavily forward biased (about 0·75A). The feedback

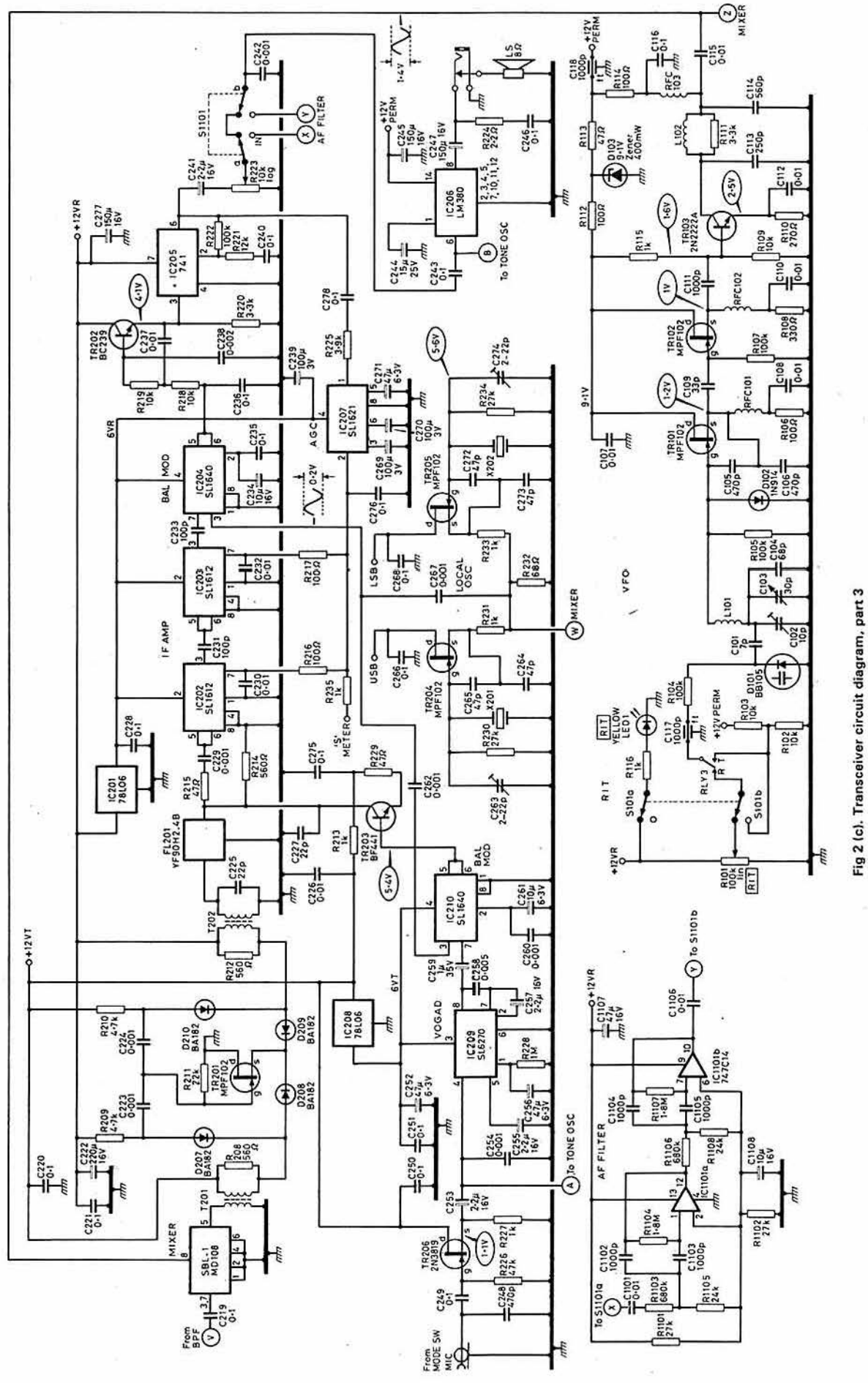


Fig 2 (c). Transceiver circuit diagram, part 3

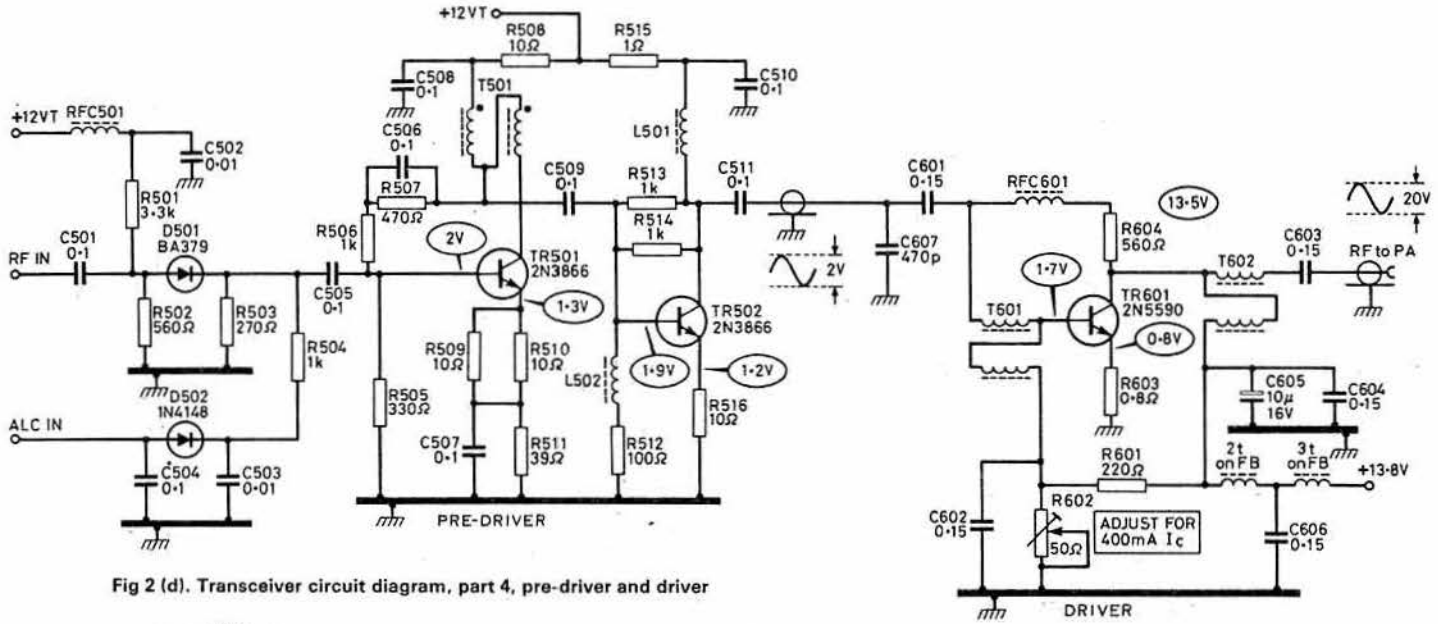


Fig 2 (d). Transceiver circuit diagram, part 4, pre-driver and driver

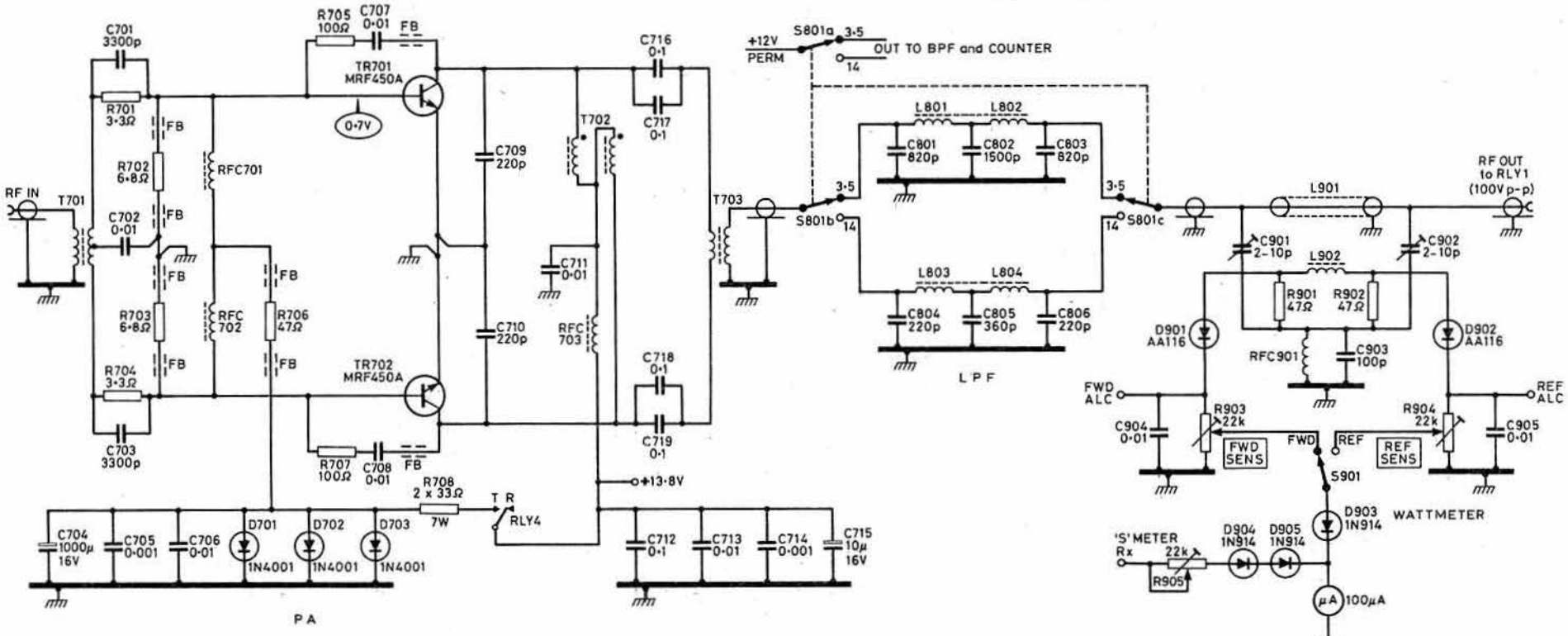


Fig 2 (e). Transceiver circuit diagram, part 5, pa, lpf and wattmeter

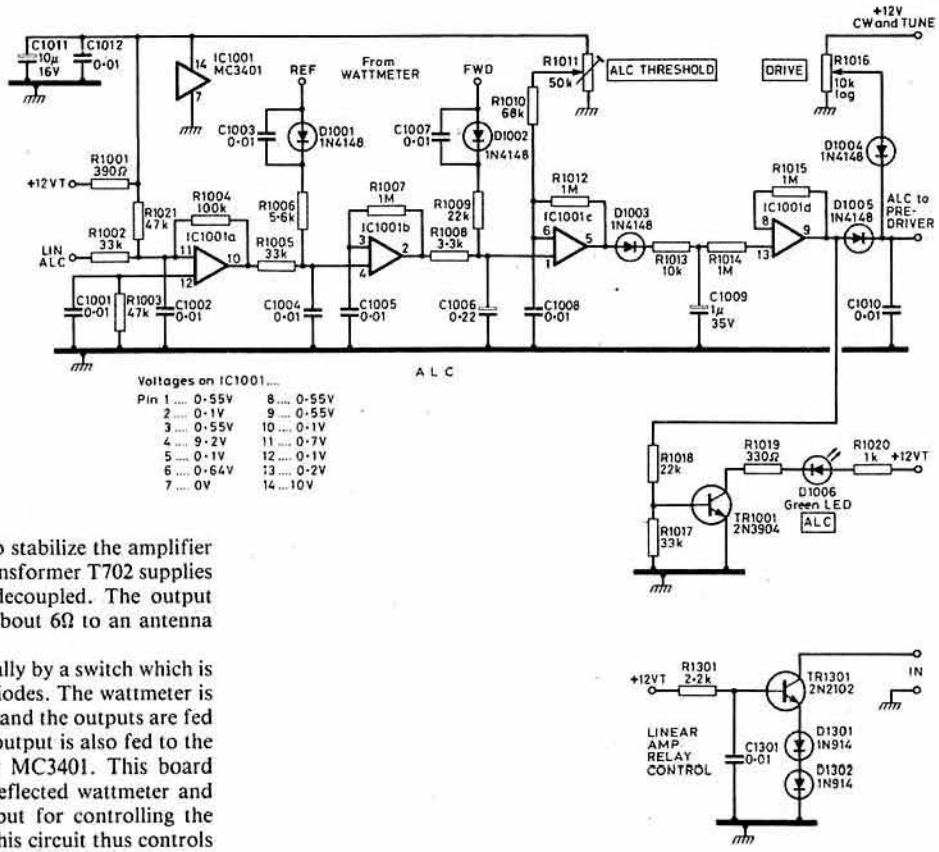


Fig 2 (f). Transceiver circuit diagram, part 6, alc and linear amp relay control

components between the collector and base help to stabilize the amplifier and provide additional gain compensation. The transformer T702 supplies dc to the collectors, and the supply is heavily decoupled. The output transformer matches the collector impedance of about 6Ω to an antenna impedance of 50Ω.

The following lowpass filters are switched manually by a switch which is also used to supply 12V to the various switching diodes. The wattmeter is a standard circuit which is not frequency sensitive, and the outputs are fed to a vswr meter, diode switched on transmit. The output is also fed to the alc circuit which consists of a quad comparator MC3401. This board amplifies and combines the forward wattmeter, reflected wattmeter and linear amplifier alc outputs,and provides an output for controlling the p.i.n. diode attenuator preceding the pre-driver. This circuit thus controls the drive to the final amplifier, preventing flat topping and providing vswr protection.

In transmit the forward voltage is routed to the non-inverting input of section C. Sections A and B are used as amplifiers and are used to amplify and sum the reflected wattmeter and linear amplifier alc outputs. The linear amplifier alc input is inverted to cope with the conventional negative-going control voltage used by most amplifiers.

The output of section B is summed with the forward wattmeter output. The result is a gain control signal representing forward power, vswr (reflected power) and linear amplifier drive level at the non-inverting input of section C. The 50kΩ potentiometer sets a threshold on the inverting input of this comparator, and when the drive-controlling signal exceeds this threshold a positive voltage is developed at the output. The threshold is set for 50W output. Thus, as reflected power increases or as the linear amplifier develops alc output, the output of the comparator becomes higher. Section C is followed by a fast attack, slow decay time constant circuit to smooth rapid variations in control voltage due to speech waveform variations. The last section is used as a buffer and the output is used to turn on an l.e.d. indicator and to supply control voltage to the p.i.n. diode attenuator. A manual drive voltage control is routed to the same point, and this arrangement allows the highest voltage to control the drive level, thus making the carrier control ineffective once the alc threshold has been reached.

CW operation is provided by means of a phase-shift oscillator, which is also operative when TUNE is selected, giving a single tone output. The frequency is approximately 750Hz.

The oscillator is keyed by means of the BFR79 transistor, and produces a perfectly clean sine wave typical of this type of circuit. The key also operates a relay driver through a keying transistor. The delay in returning to receive is adjusted by means of the 10kΩ potentiometer which varies the discharge rate of the 47µF capacitor connected to the base of the relay driver. The two diodes in the emitter circuit ensure that with key up the transistor is turned completely off. A push-to-talk switch on the microphone also switches on the transmit relay. This method was adopted as the cw key always switches on the tone oscillator. The output of the tone oscillator is fed to the vogad, and the collector output is fed to the audio amplifier, thus producing a sidetone. The tune switch is in parallel with the key, and an additional way on the switch ensures that the tone oscillator works whatever the position of the mode switch by means of the diodes across the switch. The mode switch also grounds the microphone input when cw is selected, and renders the tone oscillator inoperative when ssb is selected.

The counter uses a 7216C lsi which is a seven-digit multiplexed counter with a 10MHz clock oscillator and a maximum input frequency of 10MHz. Some samples of this ic, particularly those produced by Intersil, will work up to 15MHz, but in the interests of certain reproducability a prescaler (74LS90) was introduced. This slows down the rate of counting by a factor of 10, but the speed of counting is still perfectly acceptable.

Input to the counter consists of an SL1640 mixer which combines the vfo and carrier oscillator outputs to produce the sum and difference frequencies. Tuned circuits select the band to be passed on. These are simple parallel LC tuned circuits, diode selected.

This method is quite adequate as the counter will only respond to the strongest signal. The following amplifier, an SL1611 (an SL1612 will work just as well) amplifies the signal to a level suitable for driving a Schmitt trigger (74LS13) which converts the sine wave signal to a square wave.

Power supply unit

The transceiver needs a supply of 13·8V at 11A peak. In ssb or cw service, a supply capable of providing 7A continuous is adequate. Power can, of course, be obtained from a car battery but, as the transceiver is intended for base station use, a mains derived power supply unit is desirable. Although on-board regulators are provided in the transceiver, the pa and driver stages are supplied direct from the psu and a regulated supply is preferred, especially for cw.

Fig 4 shows the circuit diagram of a simple regulated supply. The pass transistors (TR1202 and TR1203) have a maximum collector current of 15A each, so a large safety factor is built in.

The operation of the circuit is briefly as follows. On switch-on a voltage (preset by the zener diode) is applied to the non-inverting input of IC1201. As there is no voltage on the inverting input, an output voltage appears and forward biases TR1201, which switches on the pass transistors and allows current to flow. A potentiometer across the output (R1205 and R1206) applies a voltage to the inverting input of the op-amp which alters the bias on TR1201. R1205 is a variable resistor and is used to preset the voltage to the op-amp and thus establish the output voltage. Fold-back current limiting is provided by TR1204, and is set at 14A. The circuit will withstand short-circuits across the output.

No overvoltage protection is provided as the transceiver will withstand overvoltages of up to 24V for short periods without damage.

TO BE CONTINUED

Simplified elliptic lowpass filter construction using surplus 88mH inductors

by EDWARD E. WETHERHOLD, W3NQN*

Introduction

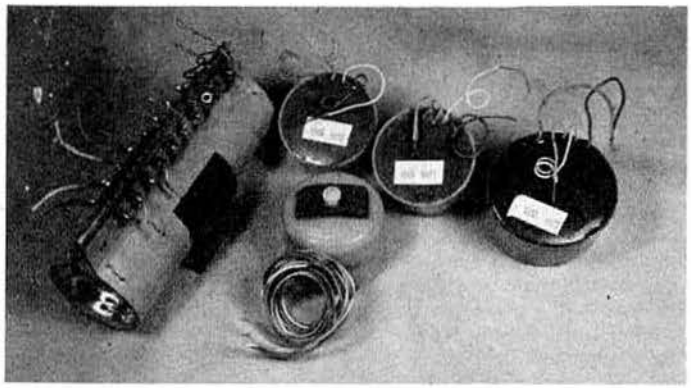
In his comprehensive article [1], G. V. Entwisle, G3MXT, explained how to apply third-method and phasing techniques in the development of ssb generators. The third-method of ssb generation required two audio-frequency lowpass filters with a sharp cutoff attenuation response, and a stopband attenuation around 45 to 50dB. G3MXT solved this lowpass filtering requirement by designing and constructing two seventh-degree elliptic filters with handwound inductors, but the large number of turns required significantly complicated the filter construction.

To simplify construction, computer-assisted calculations were made to find a suitable elliptic design that could be conveniently realized with a single unmodified stack of 88mH surplus inductors. These surplus inductor stacks are well-suited for audio filtering applications, and this article will be of interest to anyone intending to construct a third-method ssb generator, or any audio high-performance lowpass filter.

Simplified construction of modern filters

Many articles have been published on the simplified construction of modern-design passive LC filters using standard-value capacitors [2–7]. This technique is most appropriate for rf filters, where use of non-paralleled standard-value capacitors is desirable (in the rf range, the paralleling of capacitors may introduce unexpected and undesired resonances), and handwinding of inductors is easy because usually only 10 to 30 turns on a powdered-iron toroidal core gives the required inductance (in the 0·1–60μH range). For audio filtering applications, the capacitors need not have standard values because they can be paralleled in the af range without problems; however, the inductances are in the millihenry range and usually more than 200 turns are needed for each inductor. Ideally, one would use commercially manufactured toroidal inductors designed for the 300Hz to 10kHz frequency range, but the cost of these inductors is prohibitive for amateur radio applications.

The only prewound standard inductors available to the radio amateur at a reasonable price are surplus 88mH telephone line loading coils. These coils have been used by amateurs throughout the world for more than 20 years, and many articles have been published on this useful component and its properties [8–12]. Even so, it is only recently that the full capability of these toroidal inductors has been realized in the construction of relatively complex bandpass filters [13, 14]. This article explores an entirely new application of these surplus inductors in the construction of a high-performance elliptic lowpass filter, and the design and construction techniques discussed are equally applicable to the elliptic highpass filter.



The two types of surplus inductors, stack and potted. The stack dimensions are 1·5in in diameter by 4in long. The potted inductors are 1in high with diameters of 1·5 or 1·75in. One of the potted inductors is shown with a Tinnerman mounting clip. Connections are shown for 88 and 22mH

Availability of 88mH inductors

The photograph on this page shows two types of surplus 88mH inductors now available to the radio amateur. One type is an individually-potted inductor, and the other is a stack of five inductors in a cylindrical cardboard or metal case, 1·37in (35mm) diameter by 4in (102mm) long. Although these inductors are commonly referred to as 88mH inductors because this winding connection is most frequently used, they actually consist of two 22mH windings on a toroidal core of molybdenum-permalloy powder. The windings can be connected in either parallel for 22mH, or series for 88mH. This feature is important, for it provides the several combinations of inductance that are necessary to realize the elliptic design to be discussed. The inductance quadruples from 22 to 88mH when the two windings are connected in series because the turns are doubled, and since inductance varies as the square of the turns, doubling the turns quadruples the inductance (and impedance). The inductor Q is essentially identical for the parallel or series-aiding connections.

Usually the two windings are wound on opposite halves of the core to reduce interwinding capacitance, but this also results in less than perfect coupling between windings. Consequently the inductance in both parallel and series aiding connections is only about 95 per cent of what would normally be expected based on the inductance of the two separate windings. To compensate for this the separate windings are wound to give slightly more than 22mH. All windings in the parallel and series-aiding connections in this article will be assumed to have values of 22 and 88mH respectively, although the exact values may be slightly different from these nominal values.

The potted inductors shown in the photograph have their leads connected to illustrate the parallel and series aiding connections. Fig 1(a) shows the internal wiring of this inductor type and the connections for either the 22 or 88mH value. Because the inductor windings are potted in a hard compound, this inductor type can only be used in applications requiring either 22 or 88mH. Until now this constraint has made it difficult, if not impossible, to use this inductor type in complex multi-inductor filters, because turns could not be varied to change the inductance to the values required by typical filter designs. This article will demonstrate a new design technique in which a specially wired combination of five of these surplus inductors (either potted or stacked) can be used to realize the inductance values of a special seventh-degree elliptic design.

The other inductor type, perhaps more familiar to the radio amateur, is the five-inductor stack type. It is also shown in the photograph with its terminals wired to illustrate parallel and series connections. Figure 1(b) shows the internal configuration of one inductor in the stack, with directions on how to wire the terminals to get either 22 or 88mH. Because the individual inductors are not potted, they can easily be removed from the stack and modified by removing turns for any inductance value less than

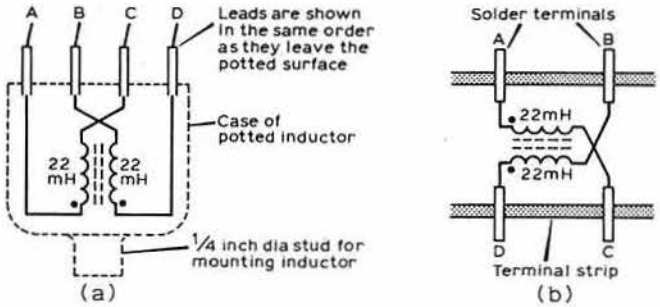


Fig 1. The internal wiring of the two coils found in the potted (a) and stack (b) inductors, and the external connections required for either the 22 or 88mH inductance values. For series-aiding connection (88mH), connect A to B to give 88mH between C and D, or connect C to D to give 88mH between A and B. For parallel-aiding connection (22mH) connect A to D and B to C to give 22mH between A and B or C and D

*Honeywell Inc, Signal analysis centre, POB 391, Annapolis, MD 21404, USA.

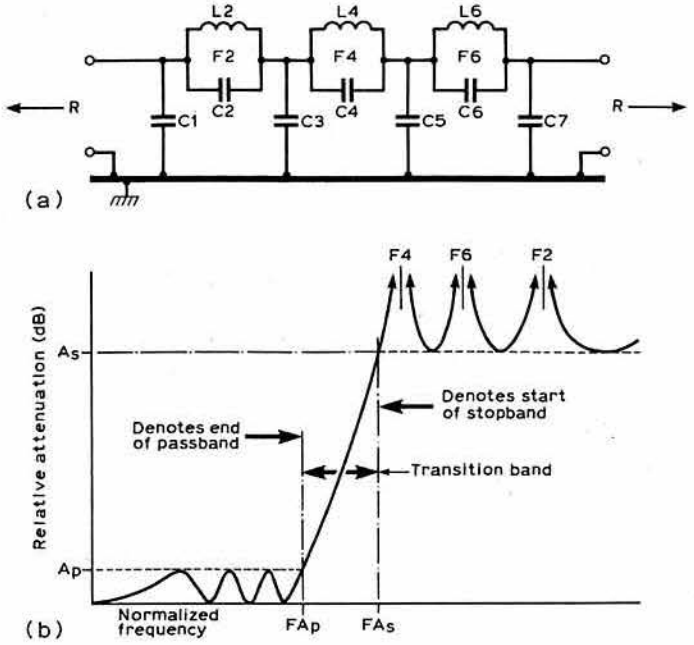


Fig 2. Elliptic lowpass filter of seventh degree: (a) schematic diagram showing component designations; (b) typical attenuation response

88mH [12]. The modified inductor can then be returned to the stack and the case resealed, or the inductor can be used separately.

In the elliptic filter application to be described, these inductors are used in their original form, so information regarding inductance versus turns removed is not required. Because of the smaller overall size and the greater ease of wiring and mounting the five-inductor stack, as compared to the potted type, the stack type can be used for building an elliptic filter suitable for installation in G3MXT's third-method circuit.

Special characteristics of the elliptic filter

An elliptic filter (as opposed to the Butterworth or Chebyshev types) was used for audio filtering in the G3MXT circuit because this type gives the most abrupt rise in attenuation. (Readers interested in learning more about this type of filter and the associated calculations should refer to [15, 16].) The seventh-degree (or three-section) elliptic design was necessary to get the required attenuation performance. Fig 2 shows the schematic diagram and the typical attenuation response of this filter.

In a typical elliptic filter design, the inductance and capacitor values usually do not repeat; that is, all the inductance values are usually different, as are the capacitor values. In comparison, the Chebyshev family of filters (the Butterworth is a special case of the Chebyshev filter in which the passband ripple amplitude is zero) has capacitor and inductor values that repeat. For example, referring to Fig 2(a), if the resonating capacitors C2, C4 and C6 are removed, the configuration is that of a seventh-degree Chebyshev filter, and for the Chebyshev values, C1 = C7, C3 = C5 and L2 = L6. This convenient relationship of the Chebyshev component values simplifies construction of the filter, but unfortunately this relationship is not available in the elliptic filter family. However, if one examines some references containing normalized elliptic designs [17, 18], it becomes obvious that there may be a special family of elliptic designs in which *L4 and L6 have identical values.* If all the elliptic designs having this unique characteristic could be found, it might be possible to find a few special designs that could be used to match the few inductor combinations available in the five-inductor stack.

After many Basic-programmed computer calculations, it was found that this unique family of elliptic designs (where L4 = L6) has a range of designs which are ideally suited for use in the audio frequency range where the minimum stopband must be greater than 45dB and the F_{A_s}/F_{A_p} ratio must be between 1·2 and 1·4. (The F_{A_s}/F_{A_p} ratio indicates the sharpness of the attenuation rise—the smaller the ratio the more abrupt the rise in attenuation.) When L4 and L6 are equal, L2 is different and larger, and the value of L2 can be expressed as a ratio relative to L4 or L6. Thus, the inductance ratios can be expressed as L2/L6 : L4/L6 : L6/L6 or "X":1:1. The computer calculations show that the L2/L6 ratio can vary between 1·2 and 1·7, with corresponding minimum stopband attenuation levels of 71·5 to 37·7dB. For the purposes of this audio filtering application, the optimum range is between 45 and 60dB. Attenuation levels greater than 60dB are generally unnecessary for audio filtering requirements, while levels less than 45dB may be too low.

Fig 3 shows the curve depicting this unique family of elliptic designs in which L4 and L6 are equal. The optimum range is indicated by the shaded portion of the curve. The normalized stopband frequency, F_{A_s}, appears on the righthand Y axis, and the corresponding minimum stopband attenuation, A_s, appears on the lefthand Y axis. It is obvious from the graph that as the stopband attenuation increases, the abruptness of the attenuation rise becomes more gradual (the normalized F_{A_s} becomes greater) for this special condition where L4 = L6.

Fortunately there are several points on the curve where the L2/L6 ratio is identical with an inductance ratio that can be obtained with a single unmodified 88mH five-inductor stack. One ratio is 132:88:88mH or 1·5:1:1. The A_s and F_{A_s} values associated with this inductance ratio are unusually well-suited for use in the G3MXT audio filtering application. That is, the attenuation rise is adequately abrupt and the minimum stopband attenuation (45·5dB) is adequate. There are also other elliptic design ratios of L2/L4 that are suitable for use with the inductor stack, but only the 1·5 ratio is of interest here. The normalized component values associated with this unique elliptic filter design were calculated from a proprietary Basic program provided by Philip Geffe, and these values will be used to find the actual component values of a filter suitable for use in the G3MXT circuit. (Mr Geffe is an internationally recognized author and authority on computer-assisted filter design and network synthesis techniques. His famous "little blue book" [19] was used by many engineers and technicians as the first understandable and practical introduction to modern filter design procedures.)

Calculation of component values from the normalized values

Table 1 shows the normalized component and frequency values of the elliptic design considered to be optimum for application in G3MXT's third-method ssb generator. An example of the calculations used to obtain these component and frequency values will demonstrate the special scaling procedure that is used when the inductor values are already known. This same procedure can be used for designing other filters having different cutoff frequencies, *so these normalized elliptic design data are universal in the sense that they can be applied for any lowpass or highpass filtering application where a single inductor stack is to be used in the filter construction.*

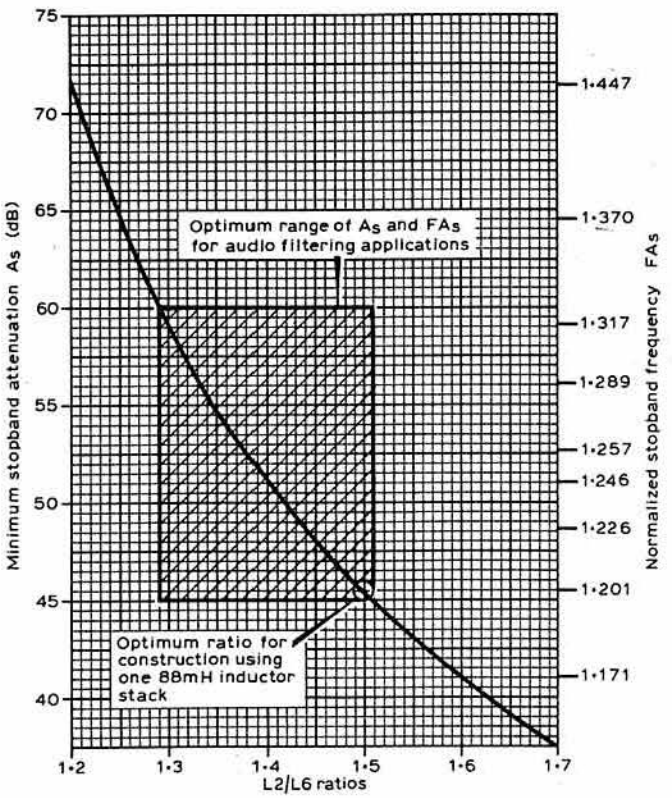


Fig 3. Stopband frequency and attenuation versus L2/L6 ratios for seventh-degree elliptic filter where L4 = L6

Table 1. Normalized parameters of an elliptic lowpass filter design for an L2/L6 ratio of 1:500

Note: This particular design is optimum for audio filtering applications when an abrupt rise in attenuation is needed and a minimum stopband attenuation of 45dB is adequate. All inductance values can be realized with a single 88mH five-inductor stack.

Termination resistance = 1·000	C1 = 0·81022F
F_{Ap} = 1·000	C2 = 0·16091F
F_{As} = 1·2012	C3 = 1·3097F
F2 = 2·2325	C4 = 0·81120F
F4 = 1·2178	C5 = 1·1427F
F6 = 1·3951	C6 = 0·61804F
A_p = 0·02831dB	C7 = 0·50758F
A_s = 45·56dB	L2 = 1·247H
Reflection coefficient = 8·060%	L4 = 0·8313H
	L6 = 0·8313H

The above element values are normalized for a cut-off frequency of 1 rad/s and 1Ω/1Ω terminations.

A typical application of an audio highpass filter is in a speech amplifier where it is desirable to attenuate voice frequencies below 300Hz. Speech frequencies below 300Hz contain little intelligence, but much power compared to the frequencies between 300 and 3,000Hz; thus a 300Hz highpass filter makes it possible to reduce the rf amplifier power load while still maintaining good speech clarity.

The usual procedure in determining the final component values of a normalized lowpass filter design (such as listed in Table 1) consists of first selecting the desired cutoff frequency (in hertz) and termination resistance (in ohms). These two parameters are used to calculate the inductance and capacitance scaling factors. The normalized component values are then scaled to the final values by multiplying the normalized values by the scaling factors. The normalized frequencies are scaled to the final values by multiplying them by the selected cutoff frequency. However, in this particular application the inductance values of L2, L4 and L6 have already been selected to be 132, 88 and 88mH; consequently, only the cutoff frequency or the termination impedance can be independently selected. Being able to independently select only one of these parameters is a compromise that must be accepted in order that the inductance values can be preselected. Because the cutoff frequency is of primary importance in this filtering application, its value will be specified, and the termination impedance will be left to fall where it may. It will be seen that this will not be a problem, as the termination impedance is such that the circuits to which the filter connects can be easily modified to provide the exact (within ±5 per cent) termination impedance required by the filter.

In the G3MXT application, it is important that maximum attenuation occurs at 1,800Hz; consequently, the scaled frequency of F4 (see Fig 2(b)) must be 1,800Hz. Since the normalized value of F4 is 1·2178 (see Table 1), then the F_{Ap} cutoff frequency must be 1,800/1·2178 or 1,478Hz. The termination impedance, R, is calculated from the selected values of L2 and F_{Ap} as follows:

$R_{(ohms)} = \omega_{Ap} \times L'2/L2 = (9{,}286{\cdot}55)(0{\cdot}132)/1{\cdot}247 = 983{\cdot}0$ where $\omega_{Ap} = 2\pi \times F_{Ap} = 9{,}286{\cdot}55$ and F_{Ap} is the cutoff frequency (1,478) in hertz, L'2 is the final scaled value in henries, and L2 is the normalized value in henries from Table 1.

The inductance and capacitance scaling factors are now calculated in the customary manner:

$$L_s = R/\omega_{Ap} = 983/9{,}286{\cdot}55 = 105{\cdot}85 \times 10^{-3}$$
$$C_s = 1/(R \times \omega_{Ap}) = 1/(983 \times 9{,}286{\cdot}55) = 0{\cdot}10954 \times 10^{-6}$$

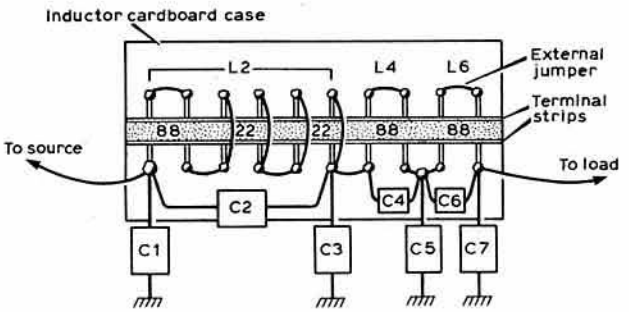
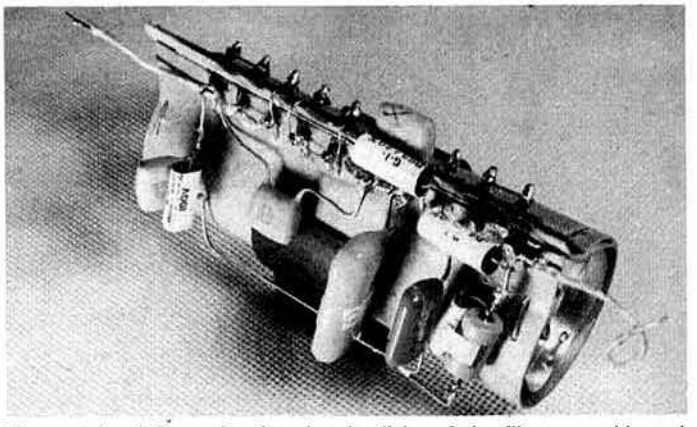


Fig 4. This shows how the jumper wires and capacitors are connected to the stack terminals. Capacitors may have to be paralleled to get the required capacitance. Component values: C1, 0·0888μF; C2, 0·0176μF; C3, 0·143μF; C4, 0·0889μF; C5, 0·125μF; C6, 0·0677μF; C7, 0·0556μF; L2, 132mH; L4, L6, 88mH. All capacitors are Mylar ±10 per cent, selected to within ±1 per cent of the design value



The completed filter, showing the simplicity of the filter assembly and mounting. C1 is at the far end of the stack. A common capacitor ground bus was used for expediency, but for maximum stopband attenuation the four capacitor ground leads must be independent of each other

The inductance values of L2, L4 and L6 are calculated in the customary manner, and if they are 132, 88 and 88mH as expected, the calculated value of R = 983Ω will be confirmed. In the following scaling equations, the L' and C' values are the final scaled values, and the L and C values are the normalized values from Table 1.

$$L'2 = L2 \times L_s = 1{\cdot}247\text{H} \times 105{\cdot}85 \times 10^{-3} = 132{\cdot}0\text{mH}$$
$$L'4 = L'6 = L4 \times L_s = 0{\cdot}8313\text{H} \times 105{\cdot}85 \times 10^{-3} = 88{\cdot}0\text{mH}$$

In a similar manner the capacitor values are calculated by multiplying each normalized C value by the capacitance scaling factor:

$$C'1 = 0{\cdot}81022\text{F}\ (0{\cdot}10954 \times 10^{-6}) = 0{\cdot}08875\mu\text{F}$$
$$C'2 = 0{\cdot}16091\text{F}\ (0{\cdot}10954 \times 10^{-6}) = 0{\cdot}01763\mu\text{F}$$
$$C'3 = 1{\cdot}3097\text{F}\ (0{\cdot}10954 \times 10^{-6}) = 0{\cdot}14346\mu\text{F}$$
$$C'4 = 0{\cdot}81120\text{F}\ (0{\cdot}10954 \times 10^{-6}) = 0{\cdot}08886\mu\text{F}$$
$$C'5 = 1{\cdot}1427\text{F}\ (0{\cdot}10954 \times 10^{-6}) = 0{\cdot}12517\mu\text{F}$$
$$C'6 = 0{\cdot}61804\text{F}\ (0{\cdot}10954 \times 10^{-6}) = 0{\cdot}06770\mu\text{F}$$
$$C'7 = 0{\cdot}50758\text{F}\ (0{\cdot}10954 \times 10^{-6}) = 0{\cdot}05560\mu\text{F}$$
$$F'_{As} = F_{As}(F_{Ap}) = 1{\cdot}2012 \times 1{,}478\text{Hz} = 1{,}775\text{Hz}$$
$$F'2 = F2\ (F_{Ap}) = 2{\cdot}2325 \times 1{,}478\text{Hz} = 3{,}300\text{Hz}$$
$$F'4 = F4\ (F_{Ap}) = 1{\cdot}2178 \times 1{,}478\text{Hz} = 1{,}800\text{Hz}$$
$$F'6 = F6\ (F_{Ap}) = 1{\cdot}3951 \times 1{,}478\text{Hz} = 2{,}062\text{Hz}$$

The scaled frequencies are found by multiplying each normalized F-value by the F_{Ap} cutoff frequency of 1,478Hz.

Filter assembly

The values of shunt capacitors C1, C3, C5 and C7 are relatively non-critical, and a capacitance tolerance of five per cent will be satisfactory. In comparison, the values of C2, C4 and C6 are critical because they determine the resonant frequencies of F2, F4 and F6. Because these resonant frequencies are primarily responsible for providing the proper stopband response, the three tuned circuits should be carefully adjusted for the design frequencies instead of using capacitors with the exact design values. Even if the exact design capacitance values are used, correct tuning of the resonant circuits is not assured because the inductor values are only nominal, and they may vary as much as two per cent.

Fig 4 shows a suggested method of wiring the five-inductor stack. A suitable assembly and tuning procedure is to connect all filter components in accordance with Fig 4, except for C2, C4 and C6. Place the assembly between a signal generator and a resistive load having the impedance values required by the design. Set the generator frequency to F2 using a frequency counter, and monitor the load voltage with an ac vtvm. Place the value of capacitance across L2 that produces resonance within about 0·2 per cent of the design value of F2. Resonance will be indicated by a null of 55dB or more below the maximum load voltage. Repeat this procedure for F6 and F4 to ensure that all three resonant circuits are correctly tuned. The actual capacitance values used should be within a few per cent of the calculated values.

For best stopband attenuation performance, the ground connections of capacitors C1, C3, C5 and C7 should be via separate leads to the chassis ground connection. The alternate grounding method of using a single common ground lead between the capacitors and the chassis ground should be avoided because the common impedance of this lead will provide a path for stopband signals to bypass the filter, thus causing the maximum stopband attenuation peaks to be less than they should be.

A photograph of the lowpass filter wired mostly in accordance with Fig 4 is shown on this page. For expediency, a common ground bus was used,

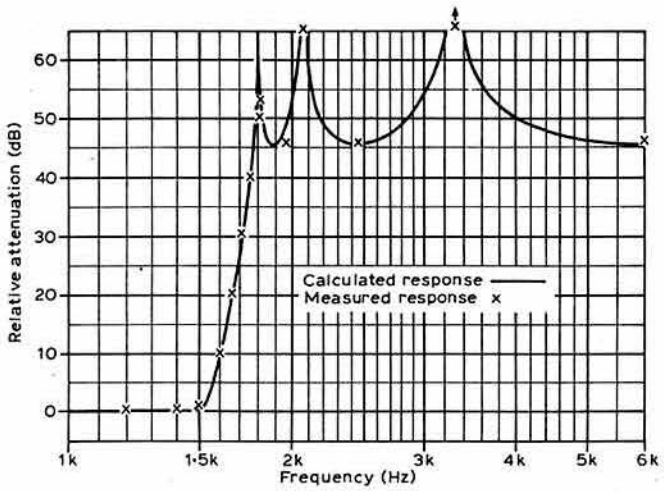


Fig 5. Computer-calculated and measured attenuation responses of elliptic lowpass filter. L4 = L6 and L2/L4 = 1·500 for R = 983Ω, F_{Ap} = 1,478Hz, RC = 8·06 per cent, A_p = 0·0283dB and A_s = 45·6dB.

Measured attenuation peak at 1,810Hz = 53dB
Measured attenuation peak at 2,062Hz = 65dB
Measured attenuation peak at 3,304Hz = 75dB
Measured insertion loss = 0·4dB at 1kHz

but this is not advisable as previously explained. Many polyester-type capacitors having nominal values of 0·15 and 0·12μF were measured to an accuracy of 0·1 per cent using a digital capacitance meter. From this selection, single capacitors were selected for C3 and C5 within five per cent of the design values. The remaining values of capacitance were obtained by paralleling capacitors as required. Although C7 is near the nominal value of 0·056μF, there were no capacitors of this nominal value on hand, so C7 was made from paralleled 0·01 and 0·047μF capacitors which measured on the low side of the standard values.

The entire filter assembly is conveniently mounted on a chassis with a standard plastic mounting clip designed to hold a 1·37in (35mm) diameter component. The convenience of this filter design, assembly and mounting technique is obvious from the photograph of the completed filter.

Filter performance

Fig 5 shows the measured and calculated relative attenuation responses of the elliptic lowpass filter recommended for use in G3MXT's circuit. A computer-controlled plotter was used to plot the attenuation levels after they were computer-calculated using a proprietary Basic network analysis program provided by Philip Geffe. The construction of the filter was started only after the calculated response curve indicated that the design was correct. This could be determined by noting that the calculated response curve agreed with the F_{A_p} cutoff frequency of 1,478Hz and with the F4, F6 and F2 peak attenuation frequencies. In addition, the plotted A_s level agreed with the expected 45·6dB value given in Table 1.

After the filter was constructed the attenuation versus frequency relative to 1kHz was measured. The measured attenuation levels are indicated by the "X"s on the graph, and they agree very closely with the computer-calculated plotted values. The insertion loss of the filter at 1kHz was an insignificant 0·4dB.

The good agreement between the measured and calculated attenuation indicates that this design should be easy to duplicate. For best results, the source and load impedances seen by the filter should be within ± 5 per cent of the design value.

Additional lowpass filter applications using the special elliptic design

By scaling the normalized component and frequency values given in Table 1 to other cutoff frequencies, this elliptic design can be applied to other lowpass filtering applications. For example, a 3kHz lowpass filter is frequently used to restrict the upper audio frequencies of voice signals before amplification or transmission and an elliptic filter can be used to provide this filtering.

Since the L'2 and L2 inductance values are fixed at 0·132 and 1·247H, an equation can be formed to show how the filter termination impedance varies with the F_{A_p} cutoff frequency. This equation is:

$$R_{(ohms)} = 2\pi(0{\cdot}132)F_{Ap}/1{\cdot}247 = (0{\cdot}6651)F_{Ap(Hz)}$$

Thus, for a cutoff frequency of 3kHz, the required filter termination impedance is 1,995·3Ω. If the cutoff frequency is slightly increased to 3,007·1Hz, the termination impedance will be an even 2,000Ω, which is preferred to demonstrate the following recommended design procedure.

For those applications where it is desired to insert the filter in an 8 or 500Ω audio system, filter impedance levels above 1,500Ω become progressively more difficult to match. This is because suitable 8Ω matching transformers in which the high-impedance windings are 1,200Ω or less are more commonly available. Consequently, for cutoff frequencies above 1,800Hz it may be advantageous to use the inductor stack in such a manner that its inductance values are one quarter of the previously discussed value. Since the filter impedance level varies directly with the inductance level, the impedance level will also be quartered. Thus the 3kHz filter can also be constructed for an impedance of 2,000/4 = 500Ω.

By a fortunate coincidence, this impedance level can be matched by the commonly available 8/500Ω matching transformer, if the filter must be used in an 8Ω audio system. In addition, because 500Ω is a commonly used audio transmission line impedance, this 3kHz filter can be placed directly in such lines. In this particular case both the filter impedance and the cutoff frequency are simultaneously optimum for many speech filtering applications.

To reduce the filter impedance level, all of the inductors in the stack are wired in the parallel aiding connection to give 22mH for each inductor. Both L4 and L6 are realized with one inductor, and the remaining three inductors are wired to give 1·5(22) = 33mH for L2. This is done by wiring two of the three inductors in parallel to give 11mH, and then connecting this combination in series with the remaining 22mH inductor to give the required 33mH. The normalized capacitor, inductance and frequency values are then scaled to their final values as previously explained. If the impedance and cutoff frequency are 500Ω and 3,007Hz, the C1 to C7 values will be 0·0858, 0·0170, 0·139, 0·0859, 0·121, 0·0654 and 0·0537μF respectively, and the L2, L4 and L6 values will be 33, 22 and 22mH. Note that because the impedance level was reduced by about half (from 983 to 500Ω) while the cutoff frequency was raised by about twice (from 1,500 to 3,007·1Hz), the old and new capacitor values are very similar because the effect of the impedance and cutoff frequency changes almost cancel each other. This effect can be anticipated from the previously-stated scaling equations for L_s and C_s. In comparison, the inductance values are quartered in the new design.

Summary

The main difficulty in constructing the typical audio filter is in realizing the inductive components. This is especially true for the radio amateur when the filter construction involves only one or two filters and the purchase of commercial inductors is not economically feasible. This article has explained how this problem can be solved by making use of a unique family of seventh degree elliptic designs in which the ratios of the three inductance values exactly match those same inductance ratios that are present in the commonly available 88mH surplus inductor stack. By properly wiring one unmodified inductor stack, it is possible to obtain the three inductor values required.

From the several possible elliptic designs that are realizable with one inductor stack, one design was selected that was optimum for the most frequently encountered audio filtering applications. A design example was explained for an application requiring a cutoff frequency of 1,500Hz, and with a minimum stopband attenuation of 46dB. Another example demonstrated how to reduce the filter impedance level to more practical levels for higher cutoff frequencies.

It is expected that this elliptic lowpass filter design will be widely used in future amateur audio filtering applications because, in combination with the surplus inductor stack, the filter is unusually easy to construct, and its attenuation performance is adequate for practically all audio filtering requirements.

How to get the 88mH surplus inductor stacks

Through the courtesy and co-operation of the Chesapeake & Potomac Telephone Company of Maryland, these inductor stacks are being made available to the author for distribution to the radio amateur fraternity. Arrangements for distributing these inductor stacks in the UK have been made with the Rev George Dobbs, G3RJV. Send a stamped self-addressed envelope to him at 17 Aspen Drive, Chelmsley Wood, Birmingham B37 7QX (Tel 021-770 5918), for further information on how to obtain these inductor stacks. Be sure to state your callsign and describe your intended application, as requests will be considered only from those having bona-fide amateur radio applications.

(Continued on page 323)

Combination rf wattmeter and parasitic detector

by FRED BROWN, W6HPH*

USUALLY when building a solidstate transmitter, exciter, or oscillator-multiplier chain, amateurs are interested in finding out two things about its output: what the power level is, and whether there are any parasitics present. High F_t transistors are notoriously parasitic-prone, and unless suitable measures are taken instability at some frequency is quite likely.

The best way to spot parasitics is to look at the output on a spectrum analyzer, one that can sweep the entire radio frequency spectrum up to at least the F_t of the highest frequency transistor in the circuit. The only problem with this approach is that few amateurs have a £10,000 spectrum analyzer in their shack or workshop.

Fortunately there is another technique that can be used, one that does not involve a laborious search of the entire rf spectrum with a tunable receiver whenever a circuit change is made. And one that, instead of costing several thousand pounds, requires only the few inexpensive parts shown in the circuit of Fig 1.

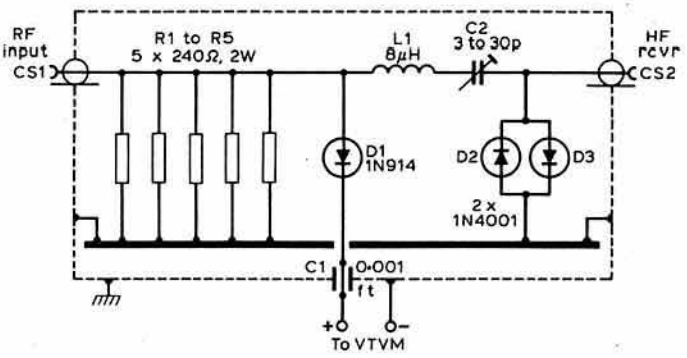


Fig 1. Five 240Ω (250Ω target value), 2W resistors are paralleled to form the 10W 50Ω dummy load. Four 200Ω, 2W resistors could also be used, but dissipation would then be limited to 8W. C1: 0·001μF feedthrough bypass. C2: 3 to 30pF mica compression trimmer (Arco 422). D1: 1N914. D2, D3: IN4001. L1: 8μH, 50t 32swg enamelled closewound on 0·25in (6mm) diameter former

This simple circuit not only detects the presence of parasitics, it also performs as a 50Ω dummy load and wattmeter. It will handle any amount of rf up to 10W continuously, or about 20W for brief periods of 2–3s—enough time to take a meter reading. Higher power levels can be measured if a power attenuator of appropriate rating is used between the transmitter and the unit.

Wattmeter function

In Fig 1, a 50Ω load is formed by five 240Ω, 2W resistors in parallel. By choosing resistors slightly higher than the nominal 240Ω, it is possible to end up with a parallel-combination value very close to exactly 50Ω.

The radio frequency voltage across the 50Ω load is rectified by diode D1, and the resulting dc voltage can be read on a vtvm or fet vm. This permits power measurements by the E^2/R formula. However, it must be borne in mind that this dc voltage will be close to the peak rf level and not the rms value. Also, the diode does not begin to rectify efficiently until an rf voltage of about 0·6V is exceeded. When these factors are taken into account, the formula for power becomes

$$\text{power, watts} = \frac{(E + 0{\cdot}66)^2}{100}$$

where E is the voltmeter reading. This formula works well for any power level from about 0·125W up to the full dissipation capacity of the five 2W resistors: 10W continuously or 20W momentarily. Below the 125mW level the curve of Fig 2 should be used.

The measured swr of the wattmeter up to 500MHz is shown in Fig 3. A

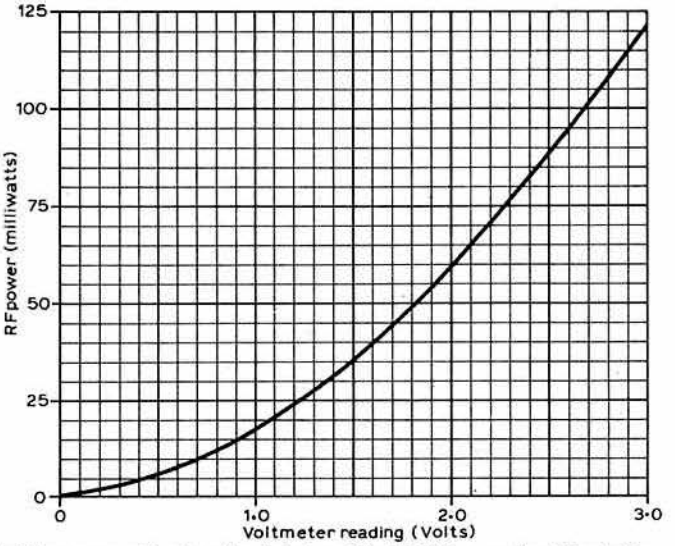


Fig 2. Voltmeter reading for rf levels below 125mW. This curve is valid only for a 11MΩ resistance voltmeter, such as a standard vtvm

power measurement accuracy of 10 per cent requires that the swr be below 1:10. Such is the case up to about 190MHz. Above that frequency the wattmeter is capable of only approximate measurements or as a relative power indicator.

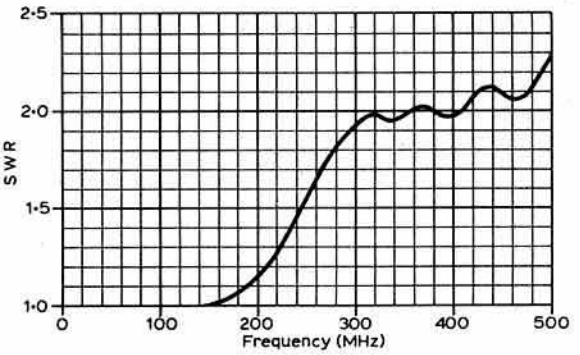


Fig 3. Measured swr of the wattmeter

Since the rectifier diode responds to peak voltage, an accurate measurement of power also demands a fairly clean spectrum at the input. For instance, presence of a harmonic or parasitic that is 20dB down can result in a power measurement that is as much as 15 per cent too high.

Parasitic detector

An understanding of the parasitic detector function is aided by a study of the spectrum illustrated in Fig 4. This shows a typical output spectrum of a solidstate amateur exciter or transmitter with a parasitic present. The desired fundamental output is f_1, the second harmonic is f_2, third harmonic f_3, etc. The parasitic fundamental is at p_1, and its second harmonic at p_2. When this spectrum is fed into CS1 of Fig 1, mixing between harmonics of the desired output, f_n, and harmonics (including fundamental) of the parasitic, p_m, will occur because of the non-linear characteristic of D1. It

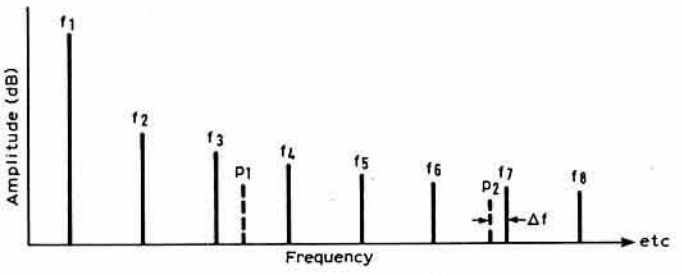


Fig 4. Output spectrum of a typical rig with parasitic present. Desired output is f_1 and harmonics are f_n. Parasitic at p_1 and second harmonic at p_2. If a p_m is separated from some f_n by a Δ f equal to the receiver frequency, mixing action will make the parasitic audible

*1169 Los Corderos, Lake San Marcos, CA 92069, USA.

does not matter how well the harmonics of f_t are suppressed in the transmitter, since the diode will create these harmonics if they are not already present.

If a communications receiver is connected to CS2 (Fig 1), and if the separation between any one of the parasitic harmonics and any one of the f_n is equal to the frequency of the receiver, the difference frequency will be received. If no parasitics are present, nothing will be heard: hence we have a parasitic detector.

At this point one may wonder where to tune the receiver. The answer is: "it does not really matter". Say that the receiver is tuned to 29MHz, usually a quiet part of the band. Somewhere in the radio frequency spectrum there will be an f_n that is separated from some p_m by a frequency difference close to 29MHz. Since the receiver passband is typically only 6kHz, it might be surmised that the difference frequency would have to be within a few kilohertz of 29MHz in order to be heard.

It must be remembered, however, that f_n is a harmonic of a crystal-controlled frequency, or of a stable vfo. On the other hand the parasitic is extremely unstable and can be moved about by any slight change, such as placing a hand near the transistor, detuning LC circuits, changing drive level or supply voltage etc. Any of these actions will cause the parasitic and its harmonics to sweep wildly about the rf spectrum, and each time one of the p_m sweeps past a point in the spectrum that is separated by 29MHz from any one of the f_n, a plop will be heard from the receiver. Usually there are a large number of plops as a finger is touched to the tuned circuits of a parasitic-producing stage. (*Fingers are not recommended where high rf or dc voltages are present*). If there are no parasitics, nothing will be heard from the speaker.

In terms of noise figure or conversion loss, the 1N914 makes a contemptible mixer, but this does not really matter as the mixer is backed up by the excellent sensitivity of a communications receiver. Even with a 40dB conversion loss the strong parasitic "signal" will inevitably be heard. Sometimes the parasitic will take the form of super-regeneration or "squegging" which will sound like a squeal or hiss in the receiver. Eventually one will learn to recognize all the different kinds of nasty noises that unstable transistors can make.

When all parasitics are completely eliminated and the rig is unconditionally stable, it will be possible to severely detune any of its LC circuits and hear nothing but background noise from the receiver.

In Fig 1 the combination of L1 and C2 forms a high L to C ratio series-tuned circuit which is resonant at 29MHz or whatever "i. f." is chosen. This prevents rf from the rig under test from being lost into the receiver, but permits the desired mixer products to pass. Of course, when testing a rig with output near 29MHz, the receiver will need to be switched to some other band, such as (say) 21MHz, and C2 adjusted accordingly. With the values shown in Fig 1, L1-C2 will resonate at about 12MHz with C2 at maximum capacitance, and at minimum capacitance the upper frequency limit is about 35MHz. C2 can be adjusted to resonate L1 to the desired frequency by running a strong steady signal from an antenna or signal generator into CS1 and adjusting for maximum S-meter reading.

For best results the receiver will be operated on a.m. (if available), maximum bandwidth, agc on, maximum rf gain, noise blanker off, and audio gain set at a comfortable level. Accidental receiver front-end damage is prevented by the limiting action of diodes D2 and D3. 1N4001 rectifier diodes prove to be better limiters at 29MHz than 1N914s and are less susceptible to burn out.

Construction

Construction details should be fairly apparent from the photographs. The device is built on a 2·5 by 4·5in (63 by 114mm) plate of 14 gauge (64mm) brass. This forms the cover for a 2·5 by 4·5 by 1in (63 by 114 by 25mm) aluminum chassis. It is important that short leads be used on the five resistors. They are arranged like spokes of a wheel around CS1 and soldered directly to its centre pin; the other ends are soldered to the brass plate.

To end up with exactly 50Ω, the five resistors should average 250Ω each. However, it is not generally realized that the resistance of composition resistors with short leads is permanently raised when they are soldered. This is caused by the heat that is conducted along the wire lead into the body of the resistor. It is best to start with presoldered values in the area of 240Ω in order to end up with an average of 250Ω after soldering: 220Ω 2W resistors are more common than 240Ω resistors, and can also be used if higher than nominal values are selected with an ohmmeter.

In the upper vhf region the diode rectification efficiency will fall off as frequency is increased. This decline can be compensated to some extent by the simple expedient of using long leads on D1. Long leads act as "peaking" inductance, and improve the high frequency response in a manner similar to the way peaking coils extend the frequency response of video amplifiers. The leads on D1 should each be about 0·5in (13mm) long for best results.

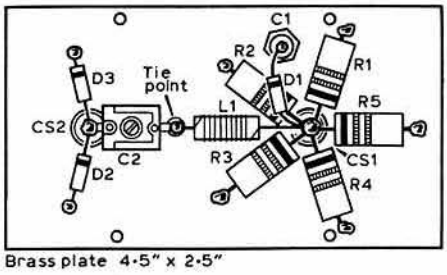


Fig 5. The five 250Ω, 2W resistors are spaced 72° apart around the input coaxial socket and are soldered directly to the brass plate with short leads

The power formula and the curve of Fig 2 will be accurate with a standard 11MΩ resistance vtvm or fet vm. Neither the curve nor the formula will be accurate for a voltmeter of different resistance. A voltmeter of more than 11MΩ input resistance can be used if it is shunted by a suitable resistor to bring the combination down to a value of 11MΩ. For instance, a 100MΩ meter would be shunted with a resistor of about 12MΩ.

If one is interested only in very low power levels, sensitivity in the milliwatt region can be improved by using a germanium diode for D1. But 20W requires a diode with a piv rating of about 90V, which is more than most germanium diodes can handle. Of course, if a germanium is used the power formula and the curve of Fig 2 will have to be modified. □

SIMPLIFIED ELLIPTIC LOW PASS FILTER CONSTRUCTION USING SURPLUS 88mH INDUCTORS

(Continued from page 321)

Acknowledgements

The author gratefully acknowledges the assistance of Mike Barge, of Honeywell, for developing the computer programs and performing the computer calculations required for this article, and of Rex Cox, of Honeywell, and Joseph Gutowski, of EWC Inc, for their review of the manuscript.

References

[1] "The G3MXT third-method Mk2 and polyphase Mk2 ssb generators", G. V. Entwisle. *Rad Com* December 1981.
[2] "Elliptic lowpass filters for transistor amplifiers", E. Wetherhold, W3NQN. *Ham Radio* January 1981.
[3] "Lowpass filters for amateur radio transmitters". *QST* December 1979.
[4] "7-element Chebyshev filters using standard-value capacitors". *RF Design* February and June 1980.
[5] "Design 7-element lowpass filters using standard-value capacitors". *EDN* Vol 26, No 1 7 January 1981.
[6] "Lowpass Chebyshev filters use standard-value capacitors". Engineer's Notebook, p160, *Electronics* 19 June 1980.
[7] "Standard C, L-input filters stabilize hf transistor amplifiers". Engineer's Notebook, p155, *Electronics* 3 November 1981.
[8] "An amateur application of modern filter design", E. Wetherhold, W3NQN. *QST* July 1966.
[9] "An RTTY bandpass filter for 1275/2125 cps". *QST* August 1967.
[10] "An RTTY bandpass filter for 2125-2975 cps". *QST* April 1968.
[11]"Inductance and Q of modified surplus toroidal inductors". *QST* September 1968.
[12] "88-mH inductors—A trap!", Harold T. Mitchell, N0ARQ. *QST* January 1983.
[13] "Modern design of a CW filter using 88- and 44-mH surplus inductors". E. Wetherhold, W3NQN. *QST* December 1980.
[14] "High-performance CW filter". *Ham Radio* April 1981.
[15] "Modern filter design for the radio amateur", W. H. Allen, MBE, G2UJ. *Rad Com* August 1971.
[16] "An introduction to elliptic filters for the radio amateur", John Wilkinson, BSc, G4HGT. *Rad Com* February 1983.
[17] *The Design of Filters Using the Catalog of Normalized Lowpass Filters,* R. Saal. Telefunken, 1966.
[18] *Handbook of Filter Synthesis,* A. Zverev. John Wiley & Sons, 1967.
[19] *Simplified Modern Filter Design,* P. Geffe. John F. Rider, 1963. □

A novel way of using handheld transceivers

by D. J. DUNN, MEng, BSc, G3XRM*

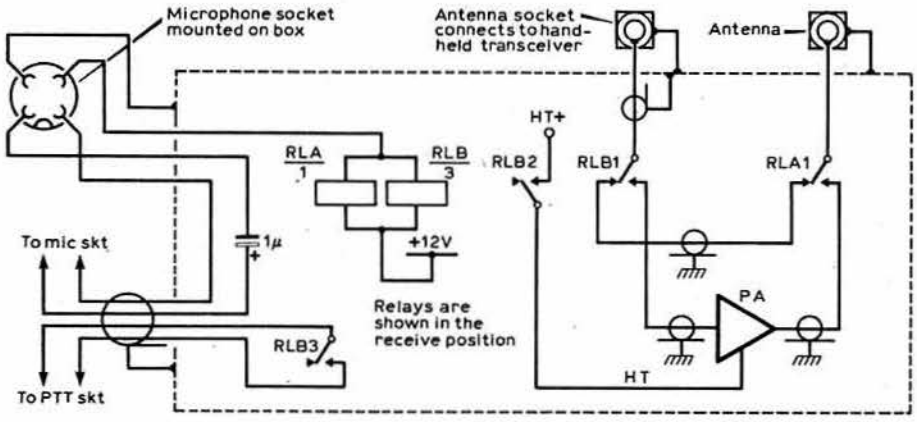


Fig 2. The control circuit

THE AUTHOR has found a novel way of boosting the power of his TR2400 handheld transceiver by cannibalizing an old Pye Cambridge. The original valve pa is used to boost the power output to more than 10W. By using the original changeover relays and adding a 9·6V regulated power supply for the handheld, a very useful base or mobile station has been made simply and cheaply. The same principles could be applied to any obsolete radiotelephone equipment.

The Cambridge used was a high band AM10. The receiver section could not be made to function, so this was stripped out along with the modulator and other parts, leaving the pa stage ht inverter and the changeover relays. Fig 1 shows the new pa circuit. Slight modifications to the ht circuit are needed due to the removal of the modulator, but if an fm version were used, this would not be necessary. R621 is connected directly to the ht rail, and a 300Ω resistor is inserted between R622 and the ht rail. This bridges the gap left by removing the modulation transformer. *Take care when working with ht, it is dangerous.* The 12V supply and the valve heater are wired with the negative line to earth on the chassis.

The rf from the handheld is coupled to the pa through a 470pF capacitor to near the centre tap of L605, the original connections to which are completely removed. Matching is obtained by moving the connection slightly away from the centre tap position to unbalance the otherwise symmetrical current flow in L605. This seems to work very well. To obtain a good match, place an swr meter in the feeder and tune C621 to give minimum reflected power. The author found that near perfect matching could be obtained by slightly adjusting the coil spacing to help the unbalancing process. Close the coils slightly on the side nearest the connection and open them slightly on the other. The adjustment of C621 is very critical and should be completed with the bottom cover fitted to the box. The circuit is not broadbanded and the tuning goes off towards the band edges.

Fig 2 shows the control circuit. The original relays RLA and RLB are energized by the ptt switch on the external microphone. RLA is the original antenna changeover relay. RLB switches the pa input, the ht and the ptt connection to the handheld. RLC may be retained to switch the 12V supply, but it is probably simpler to fit an on/off switch. A 1µF capacitor is fitted in the microphone circuit to block the dc, but if a capacitor type microphone is used, this will not be necessary.

The ht inverter is wired to run continuously but it could be made to fire only on transmit. Make a careful note of the connections on the inverter transformer before stripping the unit down: the wiring will be disrupted and the connections are not always the same as on published circuits. The author took advantage of the space inside the box to fit an extra smoothing choke and a capacitor in the ht line.

To save running down the nicad batteries in the handheld, a 9·6V regulated supply was built on a piece of breadboard and mounted on pillars inside the box. The circuit is repeated from *TT* (January 1982) in Fig 3. It was found that no special cooling requirements were needed for the LM317K regulator. Fig 4 shows the layout of the main components. Point to point wiring was used. The triac gives crowbar protection; when the output rises to 11·5V, the triac conducts and blows the fuse.

The l.e.d. and fuse holder were mounted on a small aluminium plate along with the grommets for the 9·6V outlet cable, the four-core microphone cable and the 12V supply wires. The assembly was fitted over the hole left in the side of the box produced by removal of the original multipin socket. The external microphone socket and an antenna socket for connecting to the handheld were also mounted on a small aluminium plate and fitted in place of the original control cable socket on the other side of the box. Fig 5 shows the general layout of the completed unit viewed from below the chassis.

To tune the pa, connect an swr meter between the antenna socket and a dummy load. Tune C626, C623 and C628 for minimum swr and maximum power output.

It is important to remove the nicad batteries when using the charger socket for the power supply. A better solution is to fit a miniature switch

*20 Goodwood, Bottesford, Scunthorpe, S Humberside.

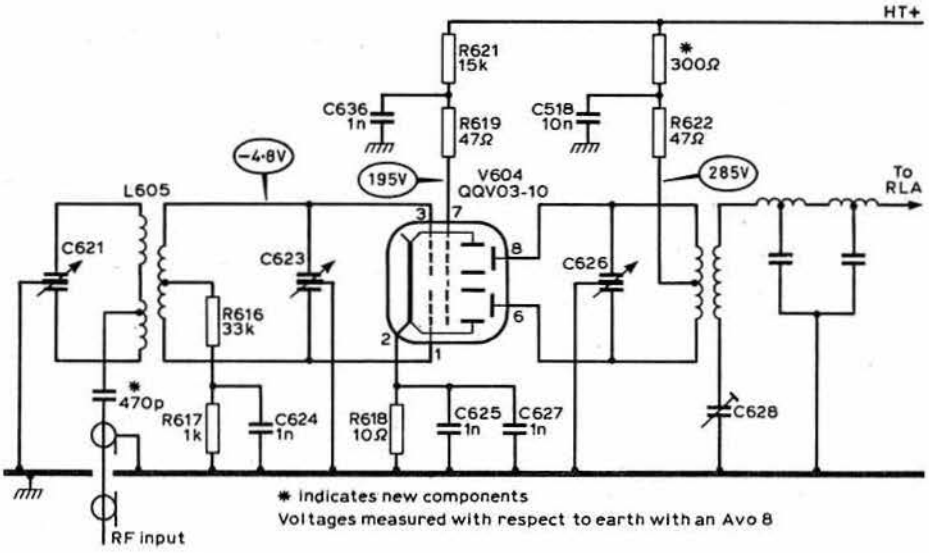


Fig 1. The pa circuit

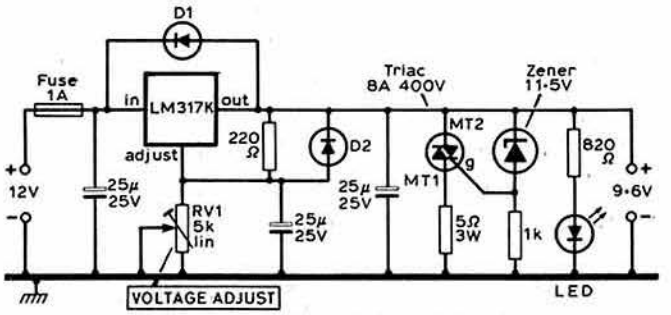


Fig 3. The 9·6V regulated supply circuit

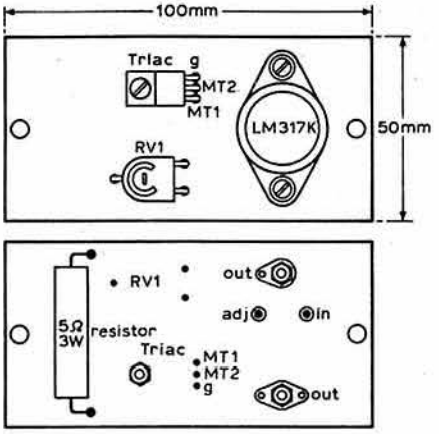


Fig 4. Main component layout for the 9·6V psu

to the battery cover to isolate the batteries from the socket. In order to avoid loss of memory when the power is switched off, it is quite simple to reroute the memory supply wire to the battery side of the switch. This leaves the memory connected to the batteries but it can still be switched off with the function switch. If these precautions are not taken, the nicads could be damaged, and the author found that the fuse on the power supply always blew when the handheld was switched off with the nicads not isolated.

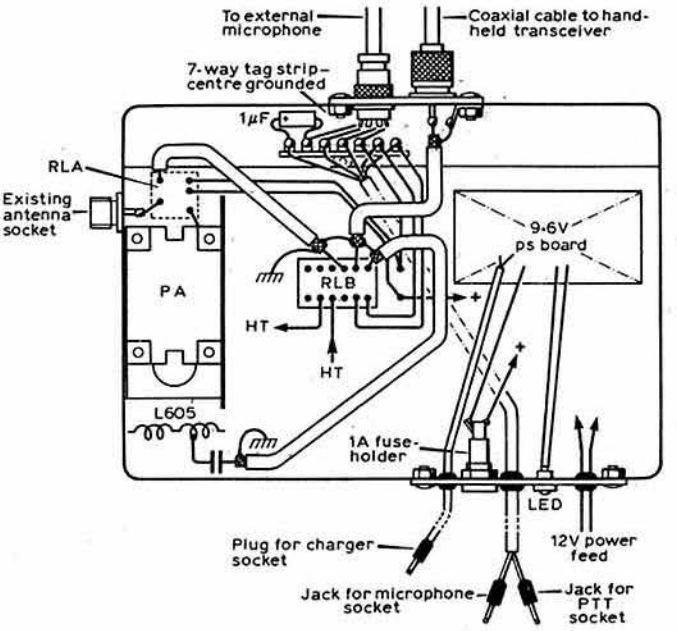


Fig 5. General layout

When using the equipment for mobile operation, the author places the box under the passenger seat and hangs the handheld on the dashboard from a microphone mounting bracket. To do this it is necessary to fit a mounting button to the back cover of the handheld. The cables can be neatly taped together and run between the two units.

The arrangement described makes an excellent mobile rig which can easily and quickly be converted back to its intended portable form. Signal reports have been excellent.

Since first submitting this article for publication, the author has successfully used the same arrangement with an FT290R transceiver. This is even simpler, because the FT290R works off a 12V supply and has its own microphone—all that is required is a connection from the ptt socket on the transceiver to energize the relays in the box by earthing one side to the chassis. □

BOOK REVIEWS

Practical Design of Digital Circuits, by Ian Kempel. 301 + XVIII pages. Published by Newnes Technical Books. First edition 1983, price £9.95. Limp covers.

In his preface the author stresses that his aim is to demonstrate the *practical* aspects of digital circuit design, recognizing the gap between a practical design approach and a purely theoretical one. His intention is that the reader will be encouraged to progress quickly to "hands-on experience". The book is aimed at a broad market: the linear design engineer wishing to cross the barrier into digital electronics; supportive reading for students; the enthusiast who wishes to design more ambitious and sophisticated projects, including electronic games, than could be attempted with linear devices. "You cannot learn faster about anything than by becoming personally involved" is a sentiment that will be endorsed by every radio amateur. Some worked design examples are given, of which the most complex is an automatic "Nim" machine in both ttl and microprocessor form. "Nim" is an electronic game in which a player can pit his skill against either another human player or against the machine.

The book—subtitled "Basic logic to microprocessors"—contains a mass of practical and useful information on digital design, logically organized and clearly presented. But it should be recognized that this book is not intended for beginners as such, but for those with a reasonably-good knowledge of linear circuit design and electronics generally. The level at which it is written, although free of mathematics and with relatively little theory, would leave some readers with puzzled frowns—although essentially practical it does not completely demolish the barrier of digital jargon that still separates the new technologist from those more familiar with an analogue approach. Nor does it escape entirely from the view that digital is modern, analogue is old-fashioned. But for those prepared to force their way through the thickets, this new book provides an excellent guide, covering much difficult terrain, in a way that few previous books have attempted.

Part 1—*Basic logic:* the ubiquitous silicon chip; from linear to digital electronics; logic gates; optimization versus minimization; timing; latch, bistable, monostable and astable circuits; registers; number systems and binary arithmetic; arithmetic devices; counters; displays and display drivers; decoders and data selectors; data selectors; data transmission and parity; logic families.

Part 2—*Design practice:* basic principles; control logic; design, construction and testing; a cmos design example—audible process timer; a ttl design example—an automated "Nim" machine—the "Autonim".

Part 3—*Microprocessors:* a 6800 microprocessing system; external data handling; the 6800 microprocessor; the cosmac microprocessor; software; hard or soft?; a microprocessor design example—an "Autonim" alternative.

Postscript. Five appendices: A, abridged ttl data; B, selected ttl pin-out details and supply currents; C, electrical characteristics; D ASCII code; E, a note on drawing standards. Index.

G3VA

Television Engineers' Pocket Book. Edited by Malcolm Burrell. 314 + VIII pages. Seventh edition. Published by Newnes Technical Books, 1982. £7.95. Limp covers.

This is the seventh fully-revised edition of a compact reference book for television service engineers which, with John Reddihough, I put together in 1954, almost 30 years ago, but with which—although still listed as a contributor—I have long lost contact as regards the actual production and revision.

It is not intended for amateur tv enthusiasts, but in fact contains a great deal of information on the principles and practice of television receivers and antennas, interference, teletext etc which would prove helpful to those interested in amateur tv transmission and/or long-distance tv reception. Essentially practical, it has been brought up-to-date carefully and expertly.

Contents: 1, Standards, wave forms and principles. 2, Basic receiver circuitry. 3, Basic timebase and power supply circuits. 4, Television integrated circuits. 5, Colour television. 6, Servicing timebases and power supplies. 7, Test equipment, installation and servicing techniques. 8, Faultfinding and alignment. 9, Aerials and interference. 10, Cathode-ray tubes. 11, Teletext and viewdata. 12, Video cassette recorders, discs and cameras. 13, Colour codes and useful addresses. Index.

G3VA

TECHNICAL TOPICS

Pat Hawker, G3VA

IT HAS BEEN SAID of broadcasters that "they have birthdays the way some people have hay fever. The nostrils tickle, the eyes water and before you can get out of the way, they are sneezing nostalgia all over the place".

Silver Jubilee!

At the risk of spreading my symptoms far and wide, I am emboldened—or exhausted— enough to mention that *Technical Topics* first appeared in the April 1958 issue of the *RSGB Bulletin*. So this month marks the 25th anniversary under the same management. While not exactly an item for the *Guinness Book of Records*, it does mean that *TT* is now almost certainly the longest-running column to come from the same pen in *any* British electronics journal, spanning virtually the entire era of the silicon revolution, though not without occasional shedding of tears over the decline of thermionics.

I can assure you that it is not easy to keep a feature devoted primarily to new technical developments going month after month without becoming boringly repetitious or riding too strongly one's own hobby horses. I can hope only that *TT* has not done this!

Isaiah Berlin has pointed out that: "The British are not much moved by economics, or economies, or by technology, and only a little by science . . . over the centuries they have adapted to the discoveries of science, but only for brief periods have they done so with enthusiasm, and the last time was more than a century ago, under the influence of a foreign prince."

I thus count myself extremely fortunate in having the privilege of writing for a clearly defined readership who have already shown their interest in and enthusiasm for radio technology by joining the RSGB and, usually, also by having or working towards an amateur licence. And although *Rad Com* is an official Society journal, its contributors are (thank goodness) not obliged to follow any party line, be kind to advertisers, show deference to the mighty, or commit any of those other sins so often ascribed to modern technical publishing.

Indeed, I am most grateful to the always constructive assistance of present and past editors and their assistants and to the Society's highly-skilled draughtsman, Derek Cole. It goes without saying that I have much reason to be grateful also for all the tremendous help received, over so many years, from so many readers, both in the UK and overseas—though sadly many of the early contributors are no longer with us. I apologise, once again, to those who may feel their ideas are sometimes overlooked or delayed, or that some queries tend to go unanswered. I can plead only that *TT, Amateur Radio Techniques,* and the many editions of *A Guide to Amateur Radio* (the revised and expanded 19th edition of which has just been published) have somehow to be squeezed into an already overcrowded 24h without unduly jeopardizing my employment! A growing problem is the number of invitations received from the secretaries of local clubs—if I accepted them all, *TT* would never get written and I would never have time to get on the air!

But enough of anniversaries, let's get down to business.

EMC, rfi and tvi

A problem that has grown rather than diminished over the past 25 years is that of electromagnetic compatibility (emc). What for amateurs began many years ago in the form of tvi and bci now spreads over virtually the entire field of electronics. EMC is basically the difficulty of mixing together a number of different electrical and electronic equipments without creating a host of mutual problems. Today we are faced with the often extremely poor emc characteristics of so much domestic equipment; we have the steadily rising pollution of the urban radio spectrum; the multiplication of rf generators in the form of cb transmitters, two-way mobile communications, radio paging, microwave ovens, leaky cable tv systems, industrial rf heating and medical diathermy etc. Then there has been the vastly increased use of thermostats for central heating, which often become defective and constitute the single most troublesome form of electrical interference; there are the thyristor light dimmers offsetting the rather

Pat Hawker, G3VA, (r) in another guise. Photographed from a tv screen during a "World in Action Special" being interviewed by Mike Walsh, Granada TV. *Photo:* Adrian Good

better filtering of fractional horsepower electric motors (though I still suffer when almost anybody in the street decides to use their electric drill).

Ignition and other electrical appliances still make vehicles a noisy environment; the modern colour tv often emits not only harmonics of its horizontal time-base/eht system but also those of its switching-mode power system. There are dozens of new devices that can both generate rfi and are themselves vulnerable to strong local fields: home computers, most digital equipment from pocket calculators to tuning displays, and the multi-channel cable tv systems that threaten to spread before long to the UK.

The pick-up of rf on microphone leads is an age-old problem for radio amateurs, but the modern station is likely to have many other units vulnerable to local rf, including electronic keyers and units using cmos devices. EMC can be a particular problem where a large number of systems have to be packaged together; for example, in communications and scientific satellites, in navy ships, in signals vehicles and anywhere where several transmitters operate in close proximity. Within the broad framework of emc engineering also falls the problem of protecting solidstate equipment against electrical transients induced by lightning, or the potential problem of nuclear electromagnetic pulses.

One gets used to almost anything causing rfi, but C. N. Bauers, G4JUV, reports a strange case of tvi. His cuckoo clock, which operates by weights and has no electrical mechanism whatsoever, emits short bursts of uhf rf every hour and half-hour. The burst is sufficient to produce a horizontal line on his tv screen; the height of the line indicating that the burst lasts 1 or 2ms. Each burst coincides with the hammer in the clock hitting the chime just before the cuckoo emerges. Shock-excitation? Perhaps he should write to *The Times* to report his seeing, on tv, the first cuckoo of the year?

Screening and filtering

In virtually all emc/rfi problems, the optimum solution is to minimize out-of-band or unnecessary in-band radiation at the source; in practice, however, interference suppression is also a matter of keeping direct or conducted interfering signals out of the affected equipment. Whereas a few years ago most electronic equipment was screened by being enclosed within a metal cabinet, the use of plastics enclosures has added to the problem. Then again there are now many forms of consumer electronics equipment that incorporate high-gain broadband amplifiers which cannot distinguish between wanted and unwanted signals.

The basic requirements for effective screening and filtering of emerging leads were set out in an early *TT* based on the work in the late 'forties by Philip Rand, W1DBM, who did so much to tackle the then urgent problem of interference to vhf television. Fig 1, taken from one of his early publications on interference problems, remains a useful guide to the reduction of rf escaping out of (or into) a shielded enclosure, emphasizing the importance of: (a) choice of suitable filtering components; and (b) the value of several stages of filtering, including the use of double shielding by having an enclosure within an enclosure. Double shielding by building the tank circuit of a power amplifier within its own enclosure has since become the standard method of reducing harmonics from amateur transmitters and transceivers, combined with the use of a good lowpass or bandpass filter(s) in the transmission line.

The basic approach to effective screening and filtering of transmitters

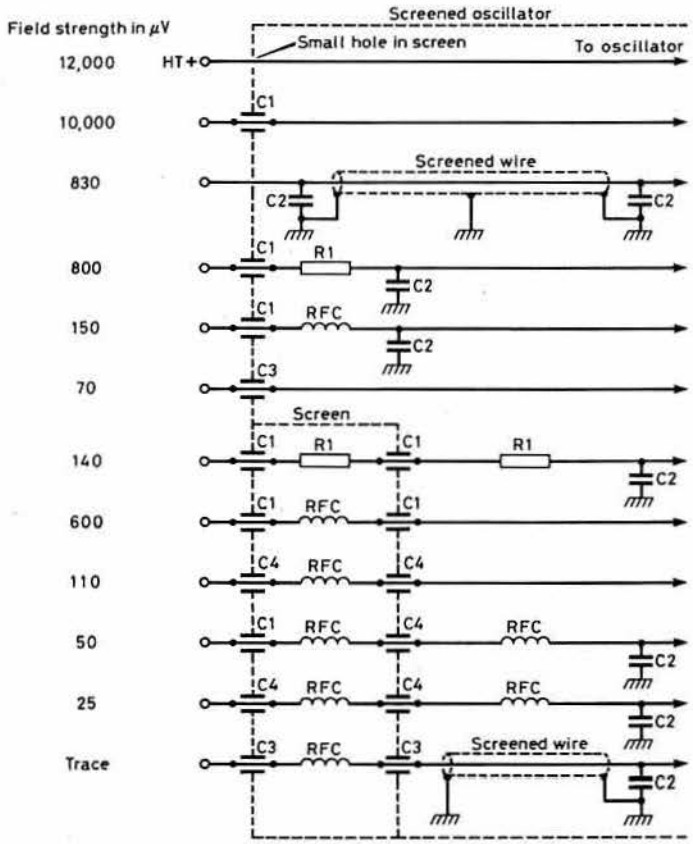


Fig 1. Comparison of filtering arrangements when leads emerge from an 80MHz transmitter enclosure, as found many years ago by Philip Rand, W1DBM

was similarly outlined by a senior FCC engineer in 1961 (still quoted in *ART*). The following were some of the points he stressed:

"In screening, consider both the magnetic and electric fields (screening the magnetic field is generally the more difficult): preferably use several stages of screening (eg put tank circuits in a screened compartment within the main enclosure); avoid openings or ports, and cover any necessary ventilating openings with mesh; use plenty of screws to secure screens; scrape paint from contact edges and avoid insulating washers.

"Do not place tank circuits near joints in a cabinet (joints may offer poor screening for the magnetic field); keep tank circuits well within their screens and use small components (since most fields fall off inversely with the cube of the distance, even a little separation can be a great help).

"Arrange internal leads and components to avoid induction of high-level signals where not required—for example, keep power cables away from the tank circuit. Beware of metering and control leads emerging from the main enclosure . . . leads emerging from the cabinet should have filtering near the point of exit with short heavy earth leads, preferably to the cabinet . . . the full burden of suppression should not be placed on a single screen or single filter."

Keeping rf out

The above notes were concerned primarily with the problem of keeping rf harmonic energy within a transmitter enclosure. However, increasingly in practice the problem today is that of preventing rf from getting into sensitive electronic circuitry. Few entirely new filtering or screening techniques have emerged during the past two decades, although more emphasis has been placed on the careful choice of components; components suitable for filtering at hf may be ineffective at uhf; on the other hand components usually considered more suitable for hf than vhf/uhf can often be surprisingly effective by making use of vhf self-resonances, in other words by using the series resonance of capacitors.

At the Dallas NAB last April, William L. Ammons, of Broadcast Electronics Inc, gave a most useful survey paper on "Practical rfi elimination techniques for the broadcast engineer". Much of his advice applies also to equipment used in amateur hf and vhf stations.

He dealt both with rfi problems brought about by radiated rf fields and also those resulting from conducted rf along power leads and other cables, conducted rf being considered the more important mode.

Radiated rf

Loose-fitting covers, doors or removable panels often represent poor shielding of electronics equipment: "a loose fitting or poorly-bonded cover often does a beautiful job of re-radiating rf into a chassis; fasteners may be a quarter-wavelength apart, seriously diminishing the effectiveness of the shielding." The following general concepts, he suggested, can be used to improve shielding:

(a) Use internal, tooth-lock washers under screw heads and nuts that join chassis members together. This type of washer bites through paint, etc to provide positive contact; scrape off paint where fasteners are used.

(b) Reduce distance between fasteners that bond chassis members together to ensure good cover bonding at vhf.

(c) Add shield strips such as fingerstock and mesh "gasket" material to removable covers and panels (note "rf gaskets" and adhesive copper tape have been developed for such applications).

(d) Short, wide bonding straps between chassis and any swing-out doors can make a big difference at vhf and uhf.

(e) For small items, a very tight rf box can be constructed out of blank, double-sided pcb material; solder all edges carefully.

Conducted rf

Unwanted rf can enter equipment via the mains leads, the antenna socket or via any leads entering an enclosure. Note, for example, that a 19in lead to a microphone may form an effective λ/4 antenna.

Fig 2 shows basic filter configurations that minimize the conduction of rf into screened enclosures: (a) single capacitor provides useful decoupling provided that the reactance of the capacitor is very low at the frequency involved and the leads are kept short; (b) at uhf, feedthrough capacitors are advisable.

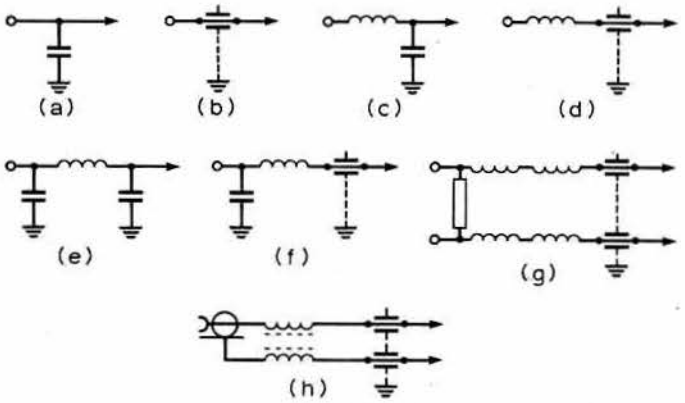


Fig 2. Filtering arrangements described by William Ammons (Broadcast Electronics Inc) at NAB 1982. For the effect of different components at different frequencies see text and Tables 1 and 2

Note that a single inductor filter tends to re-radiate rf into the enclosure; however, a series inductor plus shunt capacitor (c) can be very effective over a wide bandwidth. A 1,000pF feedthrough capacitor plus ferrite choke (d) can give 60dB attenuation at 100MHz. A correctly-designed three-element pi-filter (e) can provide some 40dB attenuation over a considerable bandwidth; again for vhf or uhf applications the third element is preferably a feedthrough type of capacitor (f). A wideband filter suitable for balanced audio lines as found in broadcast applications is shown in (g), while (h) is a wideband filter suitable for the input of a high-gain audio preamplifier, using a bifilar-wound toroid choke to filter out the differential-mode rf; because of the high input impedance the capacitor value needs to be kept low in order to reduce the loss of high-frequency af; typically a 50pF feedthrough capacitor may be used, although this can be increased with communications-type audio.

Constructional details of an easy-to-build feedthrough capacitor, as given by William Ammons, are shown in Fig 3. This indicates that a 230pF feedthrough capacitor may be easily built from commonly available materials. The impedance of a prototype capacitor of this type measured 1Ω, −65° at 110MHz and should be useful up to about 500MHz; by using two mica insulators on each side, the capacitance will be roughly halved.

It is of course important to note that at vhf some capacitors tend to act as though they were inductors; some inductors behave as though they were capacitors. This is due to the effects of self-resonances as discussed some

Table 1. Impedance versus frequency for seven different chokes

Frequency (MHz)	Choke A	Choke B	Choke C	Choke D	Choke E	Choke F	Choke G
0·5	7Ω+85°	23Ω+85°	210Ω+85°	12Ω+85°	15Ω+90°	9·6kΩ+85°	7Ω+85°
1·5	22Ω+80°	74Ω+85°	600Ω+73°	36Ω+87°	38Ω+90°	16kΩ−70°	21Ω+85°
5·0	56Ω+55°	180Ω+70°	1·6kΩ+55°	125Ω+87°	130Ω+90°	3·3kΩ−90°	68Ω+88°
10·0	80Ω+47°	250Ω+35°	2·6kΩ+40°	270Ω+74°	280Ω+90°	1·45kΩ−90°	135Ω+90°
20·0	115Ω+38°	350Ω+33°	3·6kΩ+42°	490Ω+53°	700Ω+70°	260Ω+0°	275Ω+90°
30·0	137Ω+33°	410Ω+30°	4·05kΩ−43°	640Ω+40°	1·0kΩ+40°	1·8kΩ−85°	425Ω+90°
50·0	162Ω+26°	500Ω+22°	3·2kΩ−62°	870Ω+16°	1·3kΩ+28°	600Ω−90°	800Ω+90°
70·0	175Ω+22°	540Ω+18°	2·45kΩ−70°	980Ω−6°	1·55kΩ+10°	400Ω−90°	1·5kΩ+90°
100·0	185Ω+20°	560Ω+13°	1·75kΩ−75°	880Ω−30°	1·55kΩ−28°	260Ω−85°	6kΩ+80°

Measured on Hewlett Packard 4815A rf vector impedance meter

Key to choke data

A Three 0·125in diameter ferrite beads on No22 awg wire (Fair-Rite No 2643000301)
B 0·125in diameter ferrite bead with two turns No32 wire (Fair-Rite No 2643000301)
C Seven turns No 32 wire on 0·291in-diameter ferrite bead (Fair-Rite No 2643000801)
D Choke, Ferroxcube UK200-20/4B ferrite choke
E Six turns, No 32 trifiliar wound on 0·5in diameter torroid ferrite core (Fair-Rite No 5961001103)
F Pot core, Ferroxcube, 3B7 core, 30 turns bifilar wound
G 2·2μH moulded choke (J. W. Miller, No 9250-222)

Table 2. Impedance versus frequency for five different capacitors

Frequency (MHz)	Capacitor A	Capacitor B	Capacitor C	Capacitor D	Capacitor E
0·5	840Ω−90°	370Ω−90°	32Ω−90°	36Ω−90°	3·0Ω−90°
1·5	280Ω−90°	125Ω−90°	11Ω−90°	13Ω−85°	1·2Ω−58°
5·0	81Ω−90°	37Ω−90°	3Ω−80°	4Ω−75°	1Ω+0°
10·0	41Ω−90°	18Ω−90°	1Ω−50°	2Ω−58°	1Ω+37°
20·0	19Ω−90°	8Ω−90°	1Ω+54°	1Ω+0°	1Ω+60°
30·0	12Ω−90°	4·4Ω−85°	2·2Ω+70°	1·4Ω+45°	2·2Ω+70°
50·0	4·8Ω−80°	1Ω−40°	4·0Ω+82°	2·8Ω+70°	3·6Ω+80°
70·0	1·2Ω−35°	2Ω+70°	5·8Ω+84°	4·0Ω+80°	5·0Ω+80°
100·0	3·2Ω+78°	4·6Ω+85°	8·4Ω+90°	6·0Ω+82°	7·0Ω+84°

Measured on Hewlett Packard 4815A rf vector impedance meter

Key to capacitor data

A 390pF mica, 100V dc
B 0·001μF ceramic disc, 1kV dc
C 0·01μF polycarbonate, Radial, 50V dc
D 0·01μF ceramic disc, 25V dc
E 0·1μF mylar, Radial, 50V dc

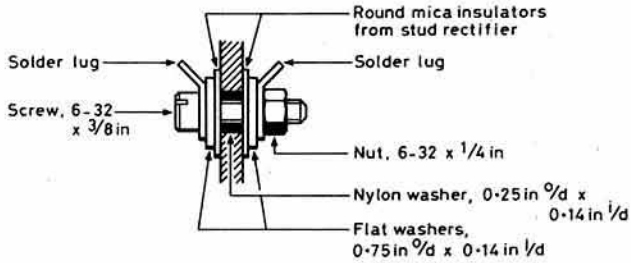


Fig 3. Home constructed 230pF feed through capacitor suitable for use to at least 500MHz. The prototype measured 1Ω-65° at 110MHz. By using two mica insulators on each side, the capacitance will be roughly half

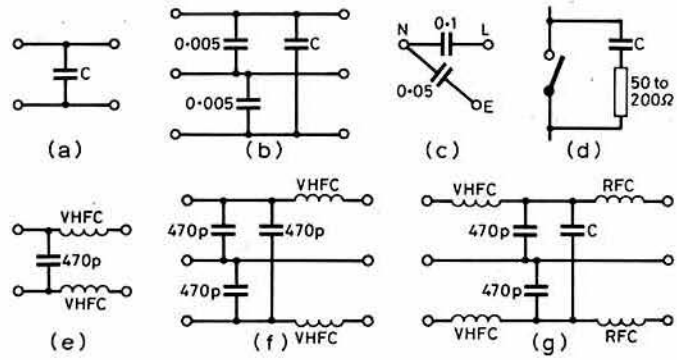


Fig 4. Commonly used mains interference-suppression filters and devices. (a) For two-core appliances; (b) For three-core appliances; (c) For a three-pin socket; (d) Suppressor for thermostat contacts etc; (e) and (f) Filters effective at vhf; (g) Filter effective at mf/hf/vhf. The value of C may vary between 0·01 and 0·5μF. On type (c) the values given are the largest permissible in order to minimize shock from leakage currents

months ago in connection with rf chokes for pi-network tank circuits. Tables 1 and 2, derived from the paper by William Ammons, show measurements made on selected modern components as found in the USA. The need to choose suitable components for the frequency range is clearly underlined. Component criteria apply equally to filters intended to prevent rf emerging from an enclosure or entering an enclosure.

Mains filtering

To round-off this survey of rfi filtering, it is necessary to mention mains filters used to prevent rf from being conducted into or out of equipment along the power cables: Fig 4. This is, of course, a major cause of rfi, and ideally one should have the filters *at the source,* although this is not always possible. It is also most important to ensure that all suppression components are adequately rated for *ac.* As noted in *ART:*

"It is most important that components of adequate ac rating should be used in suppressors, and for this reason only components specifically designed for this purpose should be fitted.

"Capacitors for suppression work have particularly strict requirements, since not only must there be a large safety factor against voltage breakdown, but the insulation resistance should also be very high and the series inductance as low as possible. Further, the capacitors are often fitted in close proximity to motors, and must be capable of withstanding high temperatures . . . .

"When fitting capacitor suppressors, it is also necessary to ensure that there is no danger that the user of the appliance may receive a shock due to leakage current. For example, on a portable three-wire appliance, the value of the capacitance between line and frame should not exceed approximately 0·005μF.

"It should be noted that leakage current will depend upon the voltage of the mains supplies; this means that values shown in American journals and books (and based on 117V) may be unsuitable for use in this country. If in any doubt whatsoever, do not attempt to carry out such work but use one of the commercially available plug or lead filters, even though these may not be quite as effective as where the suppressor components are fitted within the appliance."

20A "kiss" psu

A. J. Oakley, G4HYD, believes in keeping power supply units simple but not *too* simple. He has drawn on a number of published circuits in developing a psu capable of providing 20A continuous output (30A peak) with overvoltage protection and variable output voltage, yet using only 17 "electronic" components: Fig 5. Most components are generously rated to give good reliability. He consdiers one of the most important requirements

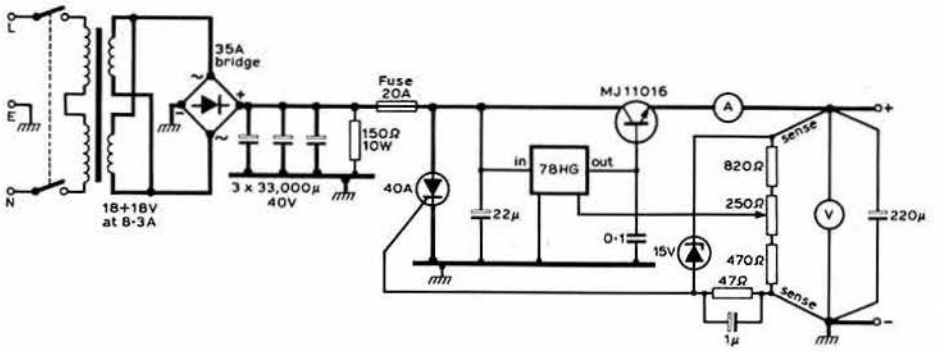


Fig 5. Simple 13·5V 20A power supply by G4HYD with crowbar over-voltage protection and variable voltage well-regulated output

is a good heatsink for the pass transistor: he uses one with a thermal resistance of 0·58/W, and even at 20A output this runs only warm. A smaller heatsink plus a reliable fan would probably prove satisfactory. A small heatsink is used with the ic regulator, but none is needed for the thyristor which conducts only for the split second required to blow the fuse.

G4HYD notes that with this type of crowbar arrangement, after the fuse blows the large reservoir capacitor remains fully charged (eg *TT* July 1982, Fig 7); yet 100,000µF at 25V represents a potentially dangerous amount of stored energy. To overcome this hazard he has adopted "valve practice" by connecting a 150Ω 10W wirewound bleeder resistance across the reservoir capacitors (three 33,000µF capacitors are more readily obtainable than a single 100,000µF unit). In fact, G4HYJ advocates care when using any high-current psu: 30A will melt a thin screwdriver blade or take the tip off a pair of pliers. Accidental short-circuits can be spectacular: for anybody wearing a ring they could be very dangerous.

His transformer is a 300W 18 + 18V unit (ILP); while this component is nominally under-rated for full output, it runs only warm to the touch provided that there is good ventilation. All wiring in the current path should be at least 2·5mm² (preferably 4mm²) and all connections should be mechanically sound before soldering. The two voltage "sensing" wires can be thinner but *must* be connected directly across the output terminals or, if there are long leads, across the input terminals of the load equipment. The two capacitors around the ic regulator should be wired directly onto the regulator pins. In practice, voltage regulation is such that variations between no-load and 20A cannot be measured on an ordinary test meter. Incidentally, an alternative version without voltage protection requires only nine electronic components.

High-power mosfet amplifiers

In *QST* (Part 1, December 1982) Helge Granberg, K7ES/OH2ZE, describes a 2-30MHz broadband linear amplifier capable of providing an output of about 1,600 to 1,800W p.e.p. or cw from 40W drive. This is based on the use of eight amplifier modules each using two Motorola MRF150 power mosfets and a high-current 50V power supply.

This is probably one of the most powerful and advanced solidstate linears yet described for amateur radio. However, before contemplating building this unit it is well worth reading carefully K7ES's useful appraisal of the current state of the "solidstate versus thermionic valves for high-power amplifiers" debate. For instance, he accepts—even from the viewpoint of an engineer working professionally with a semiconductor firm—that the solidstate approach still represents over twice the cost in watts per dollar (and probably much more if ex-equipment valves are available). It would also seem that there are still problems in finding suitable small chip capacitors capable of handling rf currents of 4 to 5A.

K7ES also explains why most solidstate transceivers are designed for broadband operation. This is because it is very difficult to design band-switched solidstate amplifiers because the low impedance levels make it impracticable to switch the passive components. As we have indicated previously, it is essential with broadband power amplifiers to include separate output filters for each band, although these can be fixed tuned.

K7ES also discusses the power fet versus bipolar transistor debate. He notes that although bipolar devices capable of 250W rf output (or about double this in water-cooled packages) are now available, power fets are currently limited to about 100 to 150W rf output. For solidstate amplifiers the push-pull configuration offers useful advantages: Fig 6 shows one of the modules in his *QST* design.

K7ES lists the following advantages for the power fet approach at hf:

(1) More tolerant to load mismatch.
(2) Simplified circuit design and biasing.
(3) Lower high-order intermodulation-distortion (imd) comparable to valves (see below).
(4) Easier to make broadband because of the higher input impedance.
(5) Gain can be controlled by varying the bias voltage; this can be used for alc shut-down without any requirement for p.i.n.-diode switches. Linear alc is possible but excessive bias reduction degrades the imd performance.

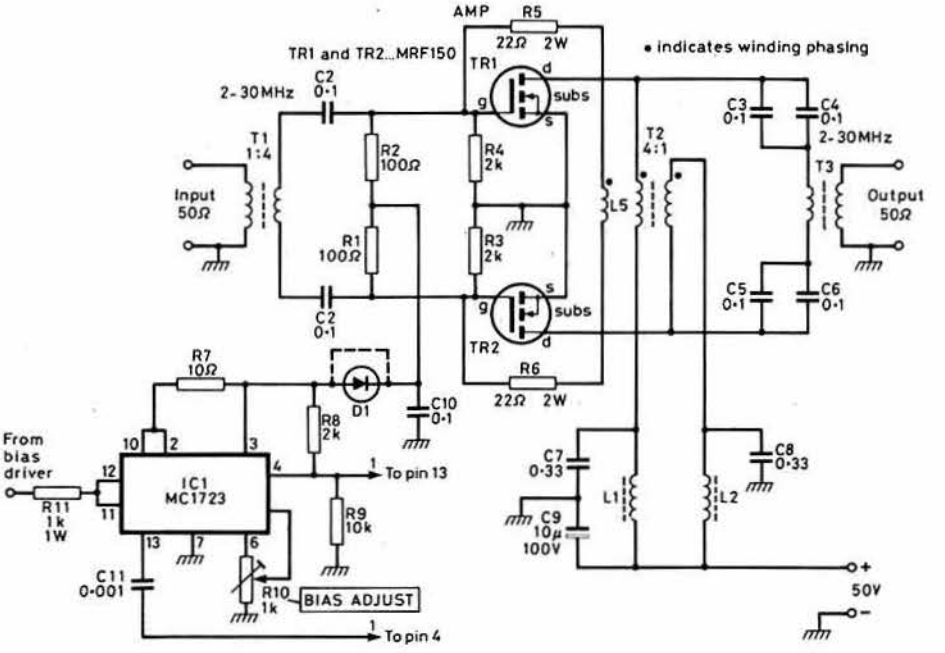


Fig 6. Circuit diagram of hf broadband linear amplifier module including bias regulator from design using eight modules to provide rf output of about 1600W. C1, C2 and C10 are monolithic capacitors. C3-C8 ceramic chip capacitors, C11 disc ceramic. Circuit given to illustrate the use of rf power mosfets, but for constructional details it would be essential to consult the original *QST* articles

(6) Higher power gain; at 30MHz this can be 3 to 6dB better.

K7ES points out that the communications industry is especially interested in (3) since high-order imd (9th order and above) causes adjacent-channel splatter. The FCC marine specification accepts low-order imd (3rd and 5th) at −20dB but demands −60dB for 9th order product. He notes that bipolar transistors usually produce much more high-order imd than either valves or power fets. My own interpretation of this is that neither form of solidstate device can yet be relied upon to provide an overall imd characteristic comparable with that of good valve linears.

In these days, with so many valve factories now closed down, my eye was caught by a recent item of industrial news: Siemens are spending several million pounds in *enlarging* their West Berlin factory that currently produces some 15,000 transmitting valves a year. *Toobs,* it would seem, are alive and well and living in Berlin.

Low loop antennas

TT, November and December 1982, raised once again the question of horizontal loop antennas such as the rectangular "G2PL Special" (turned-over quad) and G4EAQ's circular loops, as well as the variety of horizontal loop systems investigated some years ago by ZS6AKA. These systems all seem to indicate that a horizontal loop antenna can provide effective low-angle, dx-working, omnidirectional radiation, even when the wire is only a few feet above ground. It must be emphasized that it is always difficult to assess the dx performance of an hf antenna, and I sometimes suspect that it would be almost impossible to devise any piece of wire that would *never* result in dx when conditions were very good. I also subscribe to the theory that when an amateur first puts up a new antenna he tends to become more active, and this results in more and better dx until at least the first flush of enthusiasm has worn off.

But the evidence does suggest there may really be some basis for the idea that a loop performs very well at low height; although the theory that this applies also to conventional upright quad antennas, widely held for many years, is now largely discredited.

James H. Gray, W1XU, advertisements manager of *73 Magazine*, adds his support to the theory. He writes:

"For many years I have been 'playing around' with low horizontal loops, and have had some startling results. Initially, I used an 80m loop, coaxial fed through a λ/4 (electrical) of 75Ω coaxial cable as a matching transformer. The nominal impedance at the input end was close enough to 50Ω to make my transmitter completely happy. The nominal loop height was about 28ft, and results on 3·9MHz phone and 3·5MHz cw were gratifying.

"Then, upon moving to a new location, I decided to try a 40m loop. This was at only 10ft above ground, and used trees as supports. Again, the matching system of an electrical λ/4 impedance transformer was employed with success. I did do a fair amount of loop-length pruning to achieve exact resonance.

"Much dx was worked with this 40m loop. Then, along came 10MHz, so I cut the loop from 40 to 30m . . . again, with success.

"Finally, I put up an 80m loop once more, this time only 10ft high. I used the nominal formula of 1,005/f(MHz) but found it much too long! This was apparently due to the capacitance to ground making the electrical length longer than for a high loop. I cut 25ft out of the perimeter, making the overall length about 260ft. It resonates at the low end of 3·5MHz but, come spring, will need still more trimming.

"By accident I discovered a 1·8MHz resonance. This is how it happened: my wife had asked me to put up a wire dog-run in the back yard. The only place with sufficient room and clearance was in the middle of the loop, between two conveniently-located trees about 75ft apart, and with the wire at about the height of the loop antenna. When I tried to operate on 3·5MHz that evening, I had a vswr more than 3:1. Clearly the cable of the dog-run, roughly λ/4 at 3·5MHz, was detuning the loop.

"Rather than tear everything apart for a new start, I decided, just for fun, to see if there was a usable lower-frequency resonance. There was—on the 1·8MHz band! Serendipity had struck again. It's not a perfect match on 1·8MHz but is 2:1, low enough to permit operation without having to resort to using an antenna tuning unit.

"All of this strikes me as being useful, in the sense that it offers the possibility of fine-tuning a loop by erecting a nearby wire in the plane of the loop and then moving it slightly up or down—or back and forth with respect to one segment of the loop periphery. I feel reasonably confident that I shall be able to cut loops to formula, and 'tweak' them to the operating frequency by using this capacitance-loading technique. It might also provide a viable method of obtaining a 2:1, or possibly more, frequency range with a basic horizontal loop antenna. But further experimentation awaits the return of spring."

200-300V regulated psu—feedback

Paul Knight, G4BMM, was interested to see the 200-300V regulated psu described in *TT* February 1983, Fig 7, p133, based on an *Electronics* design. His firm (Coulter Electronics) has developed a very similar unit for a professional application using high-voltage op-amps. However, he notes that although the circuit diagram in *TT* is the same as that in *Electronics,* neither shows any connection to pin 3 of the MC1466L ic. This pin produces the reference current for the resistor chain for voltage selection. As shown in Fig 7, pin 3 should be connected (via diode for short-circuit protection) to pin 8, the voltage control amplifier input.

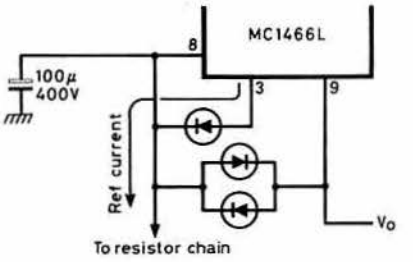


Fig 7. G4BMM's amendments to the 200-300V regulated psu described in the February issue p133

RF chokes for pi-networks

Stan Brown, G4LU, noted the comments in *TT* November 1982 on the potential problem of series-resonances in standard hf rf chokes when used in the output circuits of power amplifiers on the new 10, 18 and 24MHz bands. He feels that this problem may encourage a rather more radical approach to the design of rf chokes for this application, not based on the belief that they should always present the highest possible impedance, calling for the use of large windings etc. With the conventional approach, multiple resonances seem bound to occur if they are required to operate over the entire range 1·8 to 30MHz. He writes:

"Some 30 years ago, when I was involved in the design of an 8kW transmitter to be used over the range 4 to 27·5MHz, I adopted a different tack. I reasoned that if the choke was designed properly, and was not lossy, it could be allowed to pass some rf current. This then determined the minimum value of inductance, which would, say, pass 10 per cent of the total current. The transmitter concerned had a push-pull output stage and fed a 600Ω balanced line. The chokes were connected at the output end of the pi circuit so that each had to have a reactance of about 3,000Ω. Obviously there is an infinite range of dimensions which will provide the desired reactance so that an appropriate combination of diameter, length and pitch of winding can be chosen in order that the first λ/4 resonance is reached somewhere near the highest frequency to be used. Then the impedance will not have fallen too low, nor the first λ/2 resonance reached, at the limit of the range.

"This approach resulted in what appeared to be a very small choke when judged by normal standards, but we never encountered any problems anywhere within the working range of the transmitter, nor did one ever burn up during the time the two transmitters that we built were in service. It is necessary to ensure, of course, that the by-pass capacitor at the 'earthy' end of the choke is adequately rated for the current passing, and has a negligible reactance impedance at the highest frequency.

"There is very sparse information on the resonances of solenoids, but I recollect that for this exercise I used a graph which appeared in *Wireless World* in July 1947."

Tips and topics

R. Otterstad, LA5HE/OZ8RO/G5BHQ, draws attention to a novel and flexible form of modular switching made by the Danish firm MEC. In essence this comprises a new miniature push-button switched designed for mounting on pcb in "cells" in a special mounting frame ("Unimec"). These "Vario-support" frames are available for a single row or for a keypad type of matrix, in any cell combination from 1 × 1 to 10 × 10. Each switch unit includes two make and two break contacts so that each switch can be wired in any of five different circuit functions (two changeover contacts; two make; two break; two make/two break; reversed polarity). Information on these Unimec Mark 2 units are available in the UK through: Mr A. Brailsford, MEC, 54 Poplar Grove, Maidstone, Kent ME16 0AN (tel (0622) 674947).

Mullard metal film resistors, type MR25, MR30 (one per cent tolerance) now include a sixth broad colour band to identify the temperature co-efficient, as recommended by IEC. A brown band indicates a temperature co-efficient of 100ppm, red 50ppm. □

4-2-70

Ken Willis, G8VR*

THE GREAT THING about the vhf bands is that even when conditions are generally flat, something usually intervenes to keep interest alive. The month of February was no exception. Tropo was mostly conspicuous by its absence, but there were some good auroras. The big event was confined to those lucky few who had received permits to operate on 50MHz. They were not only making history but hopefully pointing towards the day when a more widespread use of this band becomes possible.

For me, the low spot of the month was the inauguration of breakfast tv. The number of hours during which tv is transmitted has increased to the point where almost all the time when we are not sleeping, someone is watching the box. Time was when you could come on in the morning when conditions were often quite good, and operate without fear of tvi. I have neighbours who avidly watch everything, including test-cards, and who have catered for these early morning programmes by installing a portable set in the bedroom. We all know how susceptible portables can be to tvi. To compound the felony, my reception of the vhf net on 14MHz is marred by thumping great time-base radiations from the very tv sets which show such affinity for my 144MHz signals. There ought to be a law!

Aurora

For the 27-day chart-keepers, auroras were reported from somewhere in the British Isles on 9,14,15,16 and 29 January, and on 4,5,6,7,13,15 and 23 February. For the sake of brevity, the reports received, all for 144MHz unless otherwise stated, can be summarized as follows:

9 & 14 January. GI6ATZ (Belfast) reported auroral signals heard, but no other details given. No other reports received for this event.

15 January. GM3XOQ (Shetland) observed an aurora from 1600 to 1930gmt, and worked SM5BEI (JU) and SM4KYN (HT). No other reports received.

16 January. GM3XOQ again noticed aurora at 1615gmt, lasting until 1830gmt. He worked SM3KIF (IU), SM6DPF (FS) and several other SMs in HS. Between 1718 and 1838, GM4DJS worked GM3XOQ and LA8OW, followed by OY9JD and OY5NS, both in WV square. This is great news, as many stations want to work OY, and this is further proof of activity from there on cw. It was GM4DJS's first contact with OY on any band.

29 January. Another report of auroral signals heard in Belfast by GI6ATZ. No other details available.

4 February. This was a major event, by far the biggest this year. It started around 1730gmt and produced excellent signals from the USSR. There was high activity and much QRM. At 1730 GI6ATZ first heard auroral tone on signals and later worked (on ssb) LA9BM (EU) followed by three French, one Belgian and many G, GM and GW stations. Best dx, however, was OK1MBS (HK).

GM4IPK worked several new squares to bring his total to 139, the best for him being F9LT (AI), LA1K (FX), UP2BKH (KP), OY5NS (WV), OH1ZAA (KV), SM1BSA (JR), F5SB (CJ) and EI8BV (UO). The EI in UO square is a rare one. G8VR heard Andy sign with OY5NS and could just hear the OY reply, but several calls failed to attract his attention. Also in the south, G4IJE had a pile-up from USSR stations and worked RQ2GAG (MQ), UQ2GLO (KQ), RQ2GSS (LQ), UQ2GMD (LR) and RP2PED (MP), the latest being a new square. He also worked OH1DP (LU). Paul then switched to 70MHz and worked EI2CA and EI6AS, plus a GD and a GM. The 70MHz beacons were all auroral at good strength.

Brian, G3COJ, was delighted to work a new country with UA2FAY (KO). This was his 37th country on 144MHz without the use of ms or eme.

In Holland, PA0XMA heard G3LTF with auroral tone on 432MHz, and in the same mode heard OZ7IS. Marc also copied beacons EI4RF and GB3BUX on 70MHz, plus several G stations on the same band. He has a very well-equipped station, and a four-element antenna on 70MHz. He is very keen to make auroral crossband contacts using 144·144MHz as the talkback frequency, and he can listen on 50 and 70MHz.

Malcolm, G4MKF, (Newbury) had only just finished building a 50MHz converter when the aurora came on. He was listening to GB3SIX and the tone was so poor he thought the converter was unstable. When he realized what was afoot, he moved to 70MHz and worked G stations in YO, YP and ZL squares. He also heard GB3ANG and EI4RF "growling away". The event finished at around 2100gmt. A short second-phase developed before midnight but did not last long in the south, although RQ2GAG remained a steady signal to the end.

5 February. An aurora this day was confined mainly to the north, but penetrated weakly to the south. EI6AS was a good signal in Kent, worked by G8VR. GM4DJS had 25 contacts with G, GI, GW, EI, ON, D, LA and SM. GI6ATZ worked only G, GM and GW.

GM3TAL (Dunfermline) operated cw and ssb on 70MHz and worked 13 stations between 1530 and 1821gmt. All beacons were auroral with him, but only one London area station was heard (and worked) in the form of G3WBN. A second phase at 2345gmt produced auroral-tone beacons but low activity. Only GW4HBK was worked.

G4MKF was also active on 70MHz, and between 1429 and 1859gmt worked four GMs, GD3YEO, EI6AS and some G stations.

6 February. There was a short aurora in the north between 1600 and 1700gmt. GM4DJS worked PA0XMA, PA2VST, EI4CL, OZ9PW and some G stations. GI6ATZ heard GM3JIJ but failed to raise him.

GM3TAL again concentrated on 70MHz and worked G3OIC, EI6AS and GI3TLT. EI4RF and GB3CTC were heard weakly but the other British beacons were inaudible.

7 February. GI6ATZ reported working a "handful" of GM and G stations between 1500 and 1600gmt. (Incidentally, he uses 40W to a 17-element antenna at 30ft).

13 February. GM4IPK reported beacon GB3LER "going auroral" at 0115gmt following a brief aurora on the previous afternoon.

15 February. PA0MA heard OZ1FDJ/LA from DT square at 1834gmt. Signals were fully auroral.

23 February. G4BPY copied signals with auroral tone on 50MHz.

50MHz

Operation on this band by the special permit-holders ("QTC" *Rad Com* March) got off to a good start at the beginning of February after some initial minor confusion. The permits allow operation only outside tv hours. With breakfast tv just starting up, this was construed differently by various amateurs. Because this early-morning tv appeared to limit so seriously the time available for 50MHz operation, two stations felt obliged to return their permits. The Home Office subsequently redefined the position and, after confirmation from the BBC, announced that it was only Band 1 transmission times which had to be avoided. When it was learned that no breakfast-time tv is carried by any of the BBC vhf transmitters, one of those two stations requested that his permit be re-instated, which was done immediately. Since this point was resolved there has been much early-morning activity on both 50 and 70MHz up to 0900gmt.

Previous reports in *4-2-70* dealing with the 50MHz band have contained mainly information relating to ionospheric propagation, as European stations, not being licensed for this band, have had very little else to listen for. Consequently these initial reports are somewhat unique, covering a period when operators were getting the feel of this band.

G3UKV (Telford), who was unfortunate in not being granted a permit, had copied no less than 23 of the permit holders on the band by 22 February. He had crossband contacts with several of them using either 70, 144 or 3·8MHz for talkback.

G4BPY sent in a list of both two-way and crossband contacts. He said that he had so far worked nothing exotic, and was seeking a linear amplifier to boost his present 10W. His list was virtually the same as that supplied by G3UKV. Dave, G4GLT (Coalville) worked about 16 stations between 2 and 23 February. Among these was a series of contacts with G5KW near Land's End. He was intrigued by the effect of weather on the signal. The normal signal of G5KW at Dave's location is about S4-6, but on 15 February when a high pressure area was centred over the Faeroes the signal rose to S9 plus 10dB. Dave comments, "I never realized that weather could affect propagation to that extent on 50MHz".

Brian, G3COJ, waited impatiently for the last strains of the national anthem to die away on tv in the early hours of 2 February and then promptly called "CQ". His first contact was with G4JLH in the Isle of Wight. Since that time he has found conditions "indifferent", but nevertheless managed to hear GW3LDH on tropo and GM3ZBE and GM3WOJ via ms.

Down in Cornwall, G5KW received his permit rather later than most, but by 27 February he had worked or heard about one quarter of the total of stations licensed for the band. Ken has been working G6XM, who incidentally is in Ringwood, not Christchurch. Bill's 50MHz experience goes back many years, and the contacts with G5KW bring back memories of QSOs held as long ago as 1933. Both G5KW and G6XM have provided interesting historical information about the early days on these wavelengths, and when space permits they will be included in this feature.

From time to time in *4-2-70* the merits of meteor scatter working have been extolled, and the prediction made that 50MHz would be a fine band for this mode since reflections at these wavelengths would normally be expected to be four or five times longer than on 144MHz for the same erp, and the signal level would be several decibels higher. With this sort of potential, it was not surprising that G4IJE (Essex), long known for his interest in and enthusiasm for ms working, would be in the forefront in pioneering the mode on this band. In fact in choosing stations to be given permits, consideration was given to ms working as well as other forms of propagation.

G4IJE secured the co-operation of GM3WOJ (XQ) and GM3WCS (YQ) in a series of ms tests. During February G4IJE and GM3WOJ worked on no fewer than five occasions; the first contact, on 6 February, was made using ssb, the remainder being on cw. In the north, Chris used a five-element Tonna antenna and the legal limit of power. A commercial transceiver was used for reception. Paul used all homebrew equipment

*11 Old Downs, Hartley, Kent DA3 7AA

except for his hf transceiver. The antenna was a three-element Yagi constructed to NBS specification, and the amplifier a QQVO-6-40. There was a marked difference in what was received at either end; in one sked, G4IJE copied 102 bursts and 49 pings, while GM3WOJ received only six bursts and 11 pings. To check whether this was due to a poor receiver, G4IJE is building a preamplifier for GM3WOJ of the same type as his own and they will test it on future schedules. Many commercial rigs on 50MHz are very deaf indeed. During the tests, Paul copied many bursts longer than 10s and one at 20s at S9.

In the same period, G4IJE made two complete ms cw contacts with GM3WCS, the first being on 19 February. During one of these schedules, G4IJE copied the longest burst he has ever recorded—1min 56s, and he was able to send a 47 report. GM3WCS was also using a three-element NBS Yagi at a low height but with about 30° of elevation. The path length between stations is a little too short for good ms working so some elevation is very useful. (See also comments in *4-2-70* August 1982 for discussion on this topic).

Not content with this, G4IJE built a converter for 50MHz and mailed it to DJ5MS (GI). Peter arranged a test with Paul, DJ5MS, listening on 50MHz and transmitting on 144MHz. His receiving antenna was a 14MHz dipole! This was enough for him to receive four bursts, the longest containing both callsigns twice, and another giving "rogers" plus calls, so they completed in just 1h. Peter will try once again, using a dipole, and will then pass the converter on to DF7RG who will be available for tests (arrange through G4IJE, QTHR).

Paul carried out a further 50/144 crossband test with OK1OA (HK), and they completed in under an hour at their first attempt on 2 March. OK1OA used a simple dipole propped up in his window frame. A converter is now being built for YU2ES who has been worked several times on 70/144MHz crossband. Again, check with G4IJE for sked details. Finally, OZ1FDH (GP) has a well-equipped station to listen on 50MHz, and he is also a 144MHz operator, and G4IJE will shortly be carrying out tests with that station—on ms of course.

G6DFT has been monitoring many of these tests using a simple dipole, and to date has heard 13 different stations, including the two "ms" Scots.

It should be noted that there were no major showers of meteors in February, so the excellent results achieved were through the use of sporadic meteors, the "every-day sort" which are there all the year round.

When more reports have come in and been analyzed it should be possible to start listing some "firsts" for this band and to compare propagation with 70 and 144MHz.

Stop press. G4IJE had another excellent crossband contact using ms on 5 March when he worked CT1WW in WB square. Paul transmitted on 50·146MHz and received Iago on 144·146MHz. The contact was completed in about 90min. Paul has now worked on GM, DJ, OK and CT1 using ms cw.

50MHz miscellany

PA0XMA, Marc, is equipped for reception on 50MHz (four-element antenna) and 70MHz (four-elements) and transmits on 144MHz with 40 elements. He wants crossband skeds. Telephone (0) 5233-1679 or write M. Pouwels, Mollinksweg 2x, 7691 PJ Bergentheim, Netherlands . . . GM4IHJ monitors 50MHz from 0630gmt most mornings. Has worked some locals but at time of writing had not noted any propagation enhancement . . . G3NOX is also monitoring in the morning from Saffron Walden in Essex using a five-element Tonna and an Icom 551 D . . . G4BAO (Cambridge) listens on approximately 50·107, 3·718 and 70·2MHz each day and has 25W to a two-element antenna. Rig is FT690R and homebrew amplifier. He also has highspeed cw facilities and wants ms skeds, QTHR . . . G4GLT draws attention to the fact that after G4FXW (Sheffield) there is a large gap in "permit geography" until the Scottish border. Stations in Cumbria or Tyne & Wear would be very welcome on the scene. Dave wants more people to build simple 50MHz converters and put up a dipole to work crossband . . . G3UKV is net controller of *6 Metre News & Views*, Sundays, 3,710 ± kHz at 1000gmt . . . To join the *Six Metre Group* and get their newsletter, write to G4JCC, QTHR . . . Some stations are still confused over the ms procedure. It is essential to keep sending the callsigns even when a report has been copied. When you get a 26 or even a 37 it does not necessarily mean that the other station has copied everything, only that your station has been identified. Until a roger report or full rogers have been copied, you cannot be sure that the other station has copied both callsigns and the report. See *4-2-70* August 1981, or the relevant chapter in the RSGB *Amateur Radio Operating Manual* for procedures on ms. . . . 50MHz crossband cannot be worked by Class B stations. The reason given is that the licences of Class B operators do not permit them to "communicate using bands not in their schedule of frequencies".

QTH locator systems

Following the report (*4-2-70* January 1983) on a proposed new locator system, a heavier than usual postbag shows opinions to be very divided. Some readers show reluctance to abandon the present system, while others urge the introduction of the new scheme without delay. G4DGU feels that we should be proud that this is a British innovation and not appear to be divided over its acceptance by IARU Region 1. Meanwhile the expected article on this subject has appeared in *QST* for January 1983, and only time will tell whether the Americans become as "hooked" on the squares game as most of us are in Europe. On a recent trip to the east coast of the USA I found the vhf bands as quiet as ever except for activity on fm and repeaters.

The originator of the proposed scheme, G4ANB, and Folke, SM5AGM, both felt that my comments on being rushed into a new system were somewhat prejudiced. It is not my place to take sides, of course, but I have always felt that the European vhf/uhf community is a close-knit group of individuals who know their business, and since the present squares system largely meets their needs, any changes must offer real advantages to compensate for the resulting modifications to QSL cards, maps, record-lists etc. However, time will take care of these—it must be remembered that it is not only Europe which is involved but the whole of Region 1, so a wider viewpoint must prevail. In the event, the matter is likely to be decided by IARU representatives when they meet in about 12 months time, and if a change is recommended, we shall no doubt adopt it amicably. There were many, particularly among oldtimers, who found the concept of "squares" very difficult to accept when first introduced, but few would now wish to see them discarded. If a new scheme works and is clearly more universally acceptable, there will be little room for complaint. One consolation for those who oppose a change; when that Australian or Japanese station is worked via the Phase 3 satellite, they will at least have a square to claim if a new worldwide system is introduced. The eme fraternity will no doubt be in favour of the proposed system too, for the same reasons.

Repeater information

John Butcher, G4GWJ, now in Hannover, has written pointing out that my comments in *4-2-70* for February describing the West Devon Repeater Group's activities implied that this group was responsible for the entire chain of repeaters quoted, namely GB3WR, GB3WW, GB3BC, GB3TR and GB3NC. This arose from an error in my text which should have read "coverage of existing repeaters operated by other groups". All of the repeaters listed above are in fact operated by separate groups. G4GWJ, who was previously secretary of the GB3WD group, wishes to confirm that visitors to the West Country will always find a warm welcome when they check in on any of these repeaters.

Richard Taylor, G8YHH, has provided very interesting information on GB3SM, which operates on channel RB13 from a site near the town of Leek. At the end of a typical over, this repeater sends not only a conventional "T" but also an "L" and an "H", these being transmitted 2·5kHz above and below the nominal channel centre frequency.

Normal timeout for the system is 8min; when a timeout actually occurs, the repeater's next response consists of six dots. As a guide to users, if any over exceeds 5min but does not reach timeout, then the final "T" is replaced by a "W" (warning). Locals have christened this the "waffle award"!

When the repeater is not operating in its normal configuration, the "T" this time becomes a "K", which is a way of alerting regulars that something has changed. For example, this would be the case if the output power had been purposely reduced, and users would not suspect their receivers if the signal was down and a "K" was copied.

Since GB3SM is co-channel with GB3TH, some 40 miles distant, steps have been taken to minimize interaction between the two systems, first by keeping the erp low, and next by making access to the repeater rather more difficult than a simple, 1,750kHz toneburst. An erp of only 5W is normally used, but an amplifier can be connected within 5min if higher power is demanded for any reason. Access requires a toneburst plus 5s of good audio. The access procedure must be completed within 15s or the repeater will not operate. The toneburst is not recognized as "good audio", a useful feature in defeating "blippers", while short calls on GB3TH will also fail to bring on GB3SM.

To reduce interference to GB3SM from GB3TH transmissions, a "QSO profile" detector is used. This monitors the apparent length of overs which are occurring and determines whether the timeout period should be extended from 8 to 60min, and it can make this transition even if no timeout has actually occurred. Since it is not easy to accomplish this transition every time the repeater is used, users are encouraged to take a "T" at the end of each over. Like most UK repeaters, GB3SM requires a toneburst only on

the first over, so users are requested not to operate a toneburst on every transmission. (I feel the same way about piptones on ssb!).

The logic for this sophisticated system was designed by G8YHH, the rf circuitry being the work of G8DZJ. In the past 18 months of operation, the repeater has logged only about 100h of downtime, much of it due to interruption of the mains supply. Further information can be obtained from G8YHH, QTHR.

The North Cambridge 70cm Repeater Group has submitted a proposal to the RWG for a 432MHz repeater for the Wisbech area. It is believed that there is a need for such an installation to cover gaps left by existing repeaters in that low-lying part of the Fens.

The proposed coverage would be the Wisbech, March, Chatteris area. The equipment envisaged is based on Pye T461, R460 with Mutek preamplifier and a 2 × 4-element antenna, offset to the south to afford maximum inland coverage and reduce radiation over the Wash. Although the proposed location is only 5m above sea level, the surrounding Fen is well below this. Further information can be obtained from G4NPH, QTHR.

IARU Region 1 dx records

Folke Rasvall, SM5AGM, the official records keeper, sent the following list of IARU Region 1 long-distance records for the bands covered by *4-2-70*:

50MHz		ZB2BL-JA1BK	?	11,000km 1980
70MHz	Tropo	GM3WOJ/P-GJ3WMR/P	SSB	628km 1978
	Aurora	G3OSS-GM3JFG	SSB	709km 1978
	MS	G3SPJ-GM3JFG	CW	728km 1978
	Es	G5MR-CN8MG	CW/ A.M.	2,061km 1960
144MHz	Tropo	EA8XS-GD8EXI	SSB	3,025km 1981
	Aurora	G3CHN-LZ2KBI	CW	2,138km 1981
	MS	GW4CQT-UW6MA	CW	3,099km 1977
	Es	CT1WW-OD5MR	SSB	3,864km 1979
	TE	I4EAT-ZS3B	CW	7,788km 1979
	EME	SM7BAE-ZL1AZR	CW	17,523km 1969
432MHz	Tropo	F1CXP-SM0DJW	SSB	1,913km 1982
	Aurora	DL7QY-UA3LBO	CW	1,618km 1982
	MS	EI2VAH-SK6AB	CW	1,434km 1980
	EME	I5MSH-ZL2BCG	CW	18,437km 1979

These contacts are those which were notified up to 31 December 1982. There must be additions to the 50MHz list because of the excellent ms contacts which have taken place since it was opened to the holders of experimental permits, and it may not be long before some auroral contacts take place. There are no contenders yet for either of these modes.

As for 70MHz, these records have definitely been overtaken. In the past year at G8VR, contacts were made on this band on aurora with GM3WOJ/P (YT) over a path of 882km, and on ms with GM4CJG/P (WR) over 836km. Others have almost certainly done better than this, and it is possible that some of the 144 and 432MHz records have been broken also. Write to *4-2-70* if you wish to stake a claim for any of the slots.

Sporadic-E

John Branegan, GM4IHJ, operates what is effectively a radio observatory from Fife, and he reports that in the past, Es has frequently appeared on 50MHz as early as 0700gmt. He expects things to open up soon on this new band. His records over the past three years show than on average there were three days in April when Es was present on 50MHz before 0900gmt. The figure rises to 20 days for May, 25 for June and July, 22 for August and 8 for September. Accordingly he expects our new 50MHz operators to "have a ball". Breakfast tv may create some problems, however, since it limits the time available for operating.

John obtains his information from monitoring European vhf tv. The first stations usually come on the air around 0630gmt, but he says they are rarely heard as soon as they switch on. Mostly they start to come through at about 0715gmt. His records show no Es after midnight, though he admits to having done little in the way of monitoring at such times, and the tv probably goes off before then anyway.

With good humour, John chides me for having said, last January, that "Es was still some months away". I meant on 144MHz, of course, but John says that in that same month we had no less than 14 days when Es was evident on 50MHz, while on three days it rose above 75MHz. Though we seldom get Es up to 144MHz in winter, it *can* happen, and actually did in 1981. John continues: "Please amend the notion of summer-only Es". Well, April is certainly not too early for some 144MHz Es, so dust off the monitoring equipment. Newly-licensed operators should read *4-2-70* May 1982, in that issue John Morris, G4ANB, listed a lot of useful hints on how to avoid missing such events.

As far as our own 50MHz operators are concerned, since the rest of Europe is currently denied the use of this band, any Es will have to be a one-way affair, and crossband working will be required. It is an interesting point that any Es on 50MHz will almost certainly be matched by similar conditions on 28MHz, so possibly the 28,885kHz spot will be a good one, with fallback on 3·8MHz or even the vhf net if this fails. Everything must be done to encourage Europeans to build 50MHz converters and put up simple dipoles for this band.

While on the subject of propagation at 50MHz, the following account of some experiences of Steve Richardson, G4JCC, makes interesting reading. On 26 January, Steve was up at 0600gmt to keep a sked on 70MHz. He turned his beams to the northeast, and was astonished to find very strong tv sidebands around 49·75MHz (actually up to 50·5). Outside it was pitch dark with a strong wind blowing. He was able to resolve the tv picture, which showed a dramatic film of "Russian type", no audio being heard on the appropriate sound channel. This picture continued until 0725gmt, and the carrier was audible until 0745gmt. This seems to check very nicely with what GM4IHJ has reported. Steve then copied a carrier on 50·010MHz which could have been a beacon (he suggests ZS1STB or JA2IGY), this signal persisting for about 5min. He checked other bands for Es, and found none. Beacons LA5TEN, DL0IGI, HG2BHA, DK0TE, DF0AAB and 5B4CY were all inaudible. Propagation on 70MHz was very poor, with GB3CTC inaudible and GB3BUX very weak; 144MHz was also poor, with FX0THF in the noise, whereas it normally averages S5–7. There were also no signs of aurora, as the tv picture was very steady; he reckons it was F2 propagation. To solve this "Agatha Christie" mystery, we need the services of a Hercule Poirot with some knowledge of radio physics.

From here and there

Henry, 9H1CD, says that the Maltese vhf/uhf group has chosen 1–15 June 1983 for their "9th Falcon Contest". The dates were selected to embrace part of a normally active Es period in the hope that the 144MHz band would open up between 9H1 and the UK and other parts of Europe. Starting at 0001gmt on 1 June and continuing until 2400gmt on 15 June, Maltese amateurs will be looking for dx contacts using all modes except satellites and repeaters. Those outside Malta must log a minimum of 10 9H1 stations to be eligible to compete, but the same station may be logged on more than one occasion provided the dates are different. Reports to include serial number and QTH locator, and one point/km to be awarded. Entries to PO Box 144, Valetta, Malta, not later than 1 July. You may not work 10 9H1s, but knowing there will be a lot of operators listening there between these dates will increase the chance of this prefix if you still need to work it.

Also from Malta, Walter Gatt, 9H1DU, says that Maltese amateurs hold a daily net on 144·725MHz, in which they are often joined by Sicilian amateurs so that both English and Italian are spoken. He gives no details of time or mode, but confirms that there is plenty of activity on 144MHz in 9H1 these days, especially by Class B licence holders. The Maltese Amateur Radio League (MARL) will always be pleased to receive overseas visitors. The location is in the village of Attard, in the Parochial Centre near the church. Walter says that visitors should be warned that currently it is illegal to operate a handheld transmitter in Malta, although legislation is being sought to permit this. He will keep us informed of interesting 9H1 events in future.

John Attlee, SM6FZD, is erecting a mast 21m high to support a 15-element Yagi for 144MHz and two 16-element Yagis for 432MHz, plus a dish for higher bands, all with elevation control. Those wanting skeds on any mode, including satellite operation, should write to him at Röds Bygata 1, S-42300, Torslanda, Sweden.

G8ESB has drawn attention to the fact that a group of amateurs known as the "HI Conspiracy" will be active on 144, 432 and 1,296MHz from the west coast of Scotland and some of the Western Isles between 1 and 15 April 1983. Operation will be mainly from the "Q-line" of squares. Calls used will be G6HIC and G6HIK (group calls), plus G8ESB, G6ANF, G6JQV and G6GEJ, presumably with GM and /P additions. They will be particularly on the lookout for auroral activity as well as maintaining the usual tropo watch.

A good story going the rounds relates to a BBC Band 1 transmitter in the West Country which operates unattended and went off the air due to malfunction. Three weeks elapsed before anyone telephoned to complain of loss of service. Should be an excellent place for 50MHz operation if we ever get 24h permits!

Andy, GM4IPK, is considering starting up a vhf-dx newsletter for north-of-the-border stations, and is discussing this with GM3WCS and GM4CXM. He would need input from local amateurs to make it "take off", and welcomes comment on the need and feasibility of this project from other GMs. Contact GM4IPK, QTHR.

G8VR has been appointed as an ARRL VHF Awards Manager for the newly-introduced VHF/UHF Century Club Award (VUCC), and is authorized to check QSL cards submitted with claims for this award. Full details of the award requirements are given in *QST* January 1983. □

EPHEMERIS
Satellite news and views

R. O. Phillips, G4IQQ*

OSCAR 8 continues into its fifth year with consistently good performance. Towards the end of February the operating schedule for the satellite was altered by its "owners", the ARRL, so as to avoid potential problems with the onboard battery. At the time of writing, at the end of February, the satellite was set for Mode A operation on Sunday, Monday and Tuesday, and mode J operation on Thursday, Friday and Saturday. Only a single transponder will be switched on at one time with, of course, no operation on Wednesdays. It may be necessary to make further changes to the operating schedule depending on how the battery condition responds to the reduced demand. While these changes may result in reduced availability of the satellite they are essential to prolong its life.

The main Russian satellites, RS3-RS8, now appear to have well-established operational roles, with communication transponders active on RS6 and RS8, and robot transponders on RS5 and RS7. After several months of sometimes heated argument, it appears that both RS1 and RS2 are still alive but in doubtful states of health. Positive identification has been made of RS1 from its beacon transmissions on 29·4MHz; however, nothing has been heard of the transponders.

There is not too much to report on UOSAT beyond its status last month. Attitude manoeuvres appear to be almost completed but the gravity gradient boom had not been deployed by the last week of February. Telemetry information may be obtained at weekends, either from the 1,200 baud data transmissions or the digitalker, though it may be necessary to deviate from this schedule if required by engineering operations.

*170 Shirehall Road, Hawley, Dartford, Kent DA2 7SN.

Phase 3

It would be a brave man indeed who tried to predict when the Phase 3B satellite will be placed into its highly elliptical orbit after injection by the Ariane launch vehicle from Kourou, in French Guiana. All I will say is that there is growing confidence in a launch window in June. At the same time as the construction of the 3B spacecraft, a parallel effort was taking place on 3C. Negotiations have apparently been taking place for the possible launch on board a USA vehicle.

Getting started—2

Last month I began this short series with a brief description of the station requirements to enable operation through amateur satellites equipped with Mode A type transponders. Those of you who have been able to listen to the 29MHz downlink frequency bands may already have become aware of some of the principles involved in predicting when individual satellites are available for communications. One of the basic requirements for reliable operation is knowledge of when the orbit of the satellite crosses the equator. This information may be obtained from the AMSAT-UK information nets or as a complete set of predictions for a period of two months from AMSAT-UK. The data for orbital predictions is usually presented in the following way.

Friday 1 April 1983 RS8 Mode A

Orbit	EQX-GMT	Degs W
5646	00:25:24	172
5647	02:25:10	202
5648	04:24:56	232

In fact this tells us quite a lot about the satellite. The first orbit of 1 April starts at 25min 24s past midnight and is the 5,646th orbit that the satellite has completed since it was launched. The commencement of an orbit is usually taken as the time the path of the satellite crosses the equator when it is travelling towards the North Pole. This parameter is often referred to as the EQX time and is always expressed as gmt (or utc).

The other item of data provided, Degs W, is the longitude at which the satellite crosses the equator for the previously mentioned time.

Further examination of the satellite predictions provides useful information—the period to complete an orbit is readily obtained by taking the difference between two successive orbits, ie 1h 59min and 46s for RS8. Similarly it can be seen that the equator crossing longitude progresses 30° to the west for each orbit. With this information it is possible to extrapolate to find the corresponding values for future orbits. For example, the values for orbit number 5,656 may be obtained by adding 10 times the orbital period and orbital increment to the EQX time and EQX longitude for orbit 5,646:

ie, 00:25:24 + 10 × (1:59:46) = 20:23:04gmt
and 172 + 10 × 30 = 472 = 112W.

This is essentially the technique used to produce the tables of orbital predictions, though to obtain accurate values for several months in advance it is necessary to use much greater precision as well as taking into account both long-term and short-term variations.

So we have the equator crossing time and longitude for the satellite orbit of interest. The next stage is to use this information to determine: (a) if the orbit can provide useful communication from the UK, and (b) if this is so, what are the corresponding times and bearings? A number of approaches are currently in use but the most popular is the so-called "Oscarlator", which is based on a polar projection map and a track corresponding to the orbit of the satellite. Fig 1 shows the map which, as in this case, is usually extended out to the equator, but for other locations it may be appropriate to continue to latitudes south of the equator. Also indicated are three roughly circular lines centred on southern England. These represent the elevation angle to the satellite at varying distances from the station location.

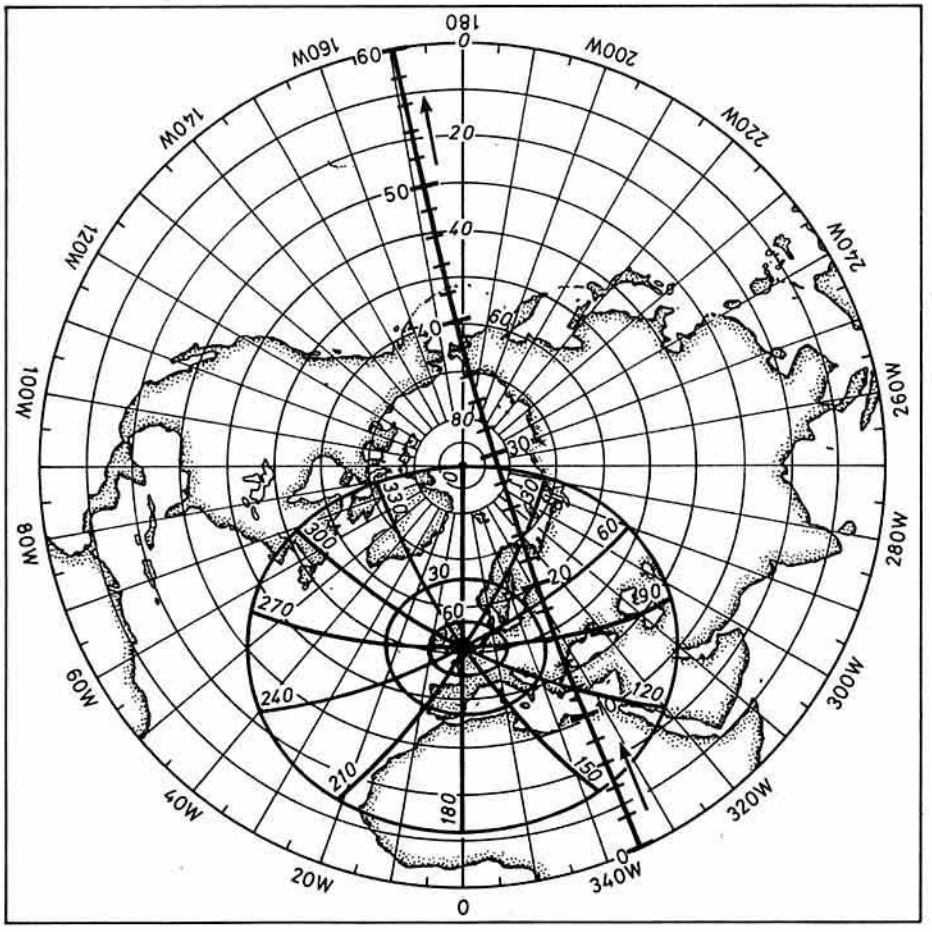


Fig 1. The polar projection map used with the "Oscarlator".

The outer ring corresponds to 0° elevation; ie the point at which the satellite appears on the horizon. The inner rings correspond to elevation angles of 30° and 60°. The final curve represents the path of the satellite during the northern part of its orbit. It is calibrated in 2min intervals so that quite accurate estimation of satellite visibility may be obtained. The procedure to obtain the bearings of the satellite for the useful part of the orbit is as follows:

Orbit data—EQX 10:29:48gmt
EQX longitude 335W

The satellite track must be set so that the point corresponding to the "0" appears at the EQX longitude with the polar points coincident.

The satellite track crosses the outer range circle at approximately 2·2min after EQX, ie at 1032gmt at a bearing of 145° from north. The bearings at other times throughout the orbit may similarly be read off the diagram.

Time (gmt)	Azimuth (degrees N)	Elevation (degrees)
1032	145	0
1036	120	−20
1038	90	−28
1042	30	−15
1044	15	0

It is very useful to draw up such a table well in advance of the selected orbit so that the number of operations required during the actual satellite pass may be kept to a minimum. Next month I will move on to the method of establishing a QSO through one of the satellites.

Other news

Reports from South Africa indicate that tests using mode J-type transponders aboard balloons have been carried out recently. This news appears to have aroused some interest in the UK, and enquiries have been made of the possibility of similar experiments over here. There must surely be at least one of the readership with some involvement in ballooning—any offers?

The University of Surrey has almost completed a handbook on the UOSAT satellite. The publication is primarily intended for educational establishments, and will be available directly from the university.

Last year saw the deployment of the ISKRA 2 and 3 satellites from the Soviet space station SALYUT 7. In spite of the low orbit and, therefore, short lifetime of these satellites, plans have been made known for a considerable number of additional launches in the future. On the subject of Russian satellites, Ron Broadbent, G3AAJ, was alerted on 20 February to the presence of a new signal in the 29·4MHz satellite sub-band. The signal, with a station identification of RS00, exhibited all the signs of a satellite emission and re-appeared after some 87min which would be consistent with a Salyut type of orbit. Nothing more was heard in the subsequent week but hopefully all will be revealed in the near future.

Ron also reports that authorization has been received from the Home Office for AMSAT-UK to operate news transmissions on one of the special service channels of Phase 3B. Initially transmissions will take place on Sunday mornings using ssb and cw; however, there are plans for additional services in the future. □

RAYNET

G. Cluer, G4AVV*

PEOPLE WHO ARE NOT members of Raynet may have been concerned to see those who are going round with faces that alternated between happy and miserable expressions. The problem began well over a year ago when the Home Office indicated that it had no record of Raynet having been given permission to assist at charity walks, county shows and other useful but non-disaster events. They said that the amateur licence gave amateurs permission to work with the user services only for disaster relief and not for these other events, and they prohibited Raynet from continuing. The problems arose after changes in Home Office personnel and after the death of Peter Balestrini so that there was no record of their agreements. After some discussion they soon agreed that Raynet could again assist at county shows and similar functions, but marathons and the like were still forbidden. It was not that Raynet groups really felt that this was what Raynet should be doing with their amateur licences, but that disasters (thankfully) happen only rarely and groups wanted the opportunity to work with their user services to get to know them, to enable the user services to know Raynet's capability, and for practice.

Last December the RSGB announced that the Home Office agreed that marathons, charity walks and so forth would be treated by the Home Office as exercises, and that Raynet could now go ahead with them. There was a limit of 12 such events per year, but no-one minded this too much. Soon, though, faces again dropped as it became apparent that the restriction was one per month and not 12 per year and, even worse, Raynet groups could now not exercise without the user service. This was disastrous and many groups wrote to say so. A number held exercises each week; some did not have a user service. How were new groups to get under way with such a restriction? Didn't the licence allow . . .? etc. It was a few more weeks before the fog cleared and Raynet controllers again smiled. The "one per month" and "only with the user service" restriction only applied to charity walk and marathon-type exercises where third party messages were passed. Internal, message-handling or non-third-party exercises were not included in the restriction. They were allowed as frequently as wished so long as they followed the provisions of the licence.

So what is the situation now? Raynet groups can exercise by themselves as often as they wish so long as they only pass pretend messages. They cannot pass messages for another person.

Raynet can exercise with a user service at marathons etc, when they may pass third-party messages on behalf of the user service. This sort of operation is limited to one per month per group, and the RSGB must be informed on a yellow card that has now been issued to controllers. Raynet members (and only Raynet members) may take part only at the request of a named user service and not for any other body which just happens to be organizing a marathon or charity walk. Discussions to increase the number of user services named on the licence continue.

Any amateur can pass messages for a user service during disaster relief.

Brian Goddard, G4FRG (recently confirmed as chairman of the Raynet Committee for another session), believes that these concessions go a very long way towards satisfying the requirements of Raynet members, and he hopes that groups will now make contact with their user services to get to know them and to work with them so that the professionalism and resources available to Raynet will be appreciated by the users. Furthermore, the Raynet Committee will be able to get on with the work of serving its members without the problems associated with not knowing whether it will exist in a viable form. □

*12 Bingham Road, Addiscombe, Croydon CR0 7EB.

Major flood alert—Norfolk and Suffolk coasts, February 1983

Reported by G6AD

BY THE VERY NATURE of its situation in relation to the North Sea, the East Anglian coast remains constantly susceptible to the effects of inclement weather. So it came as no surprise when the Norfolk & North East Suffolk Raynet Group was called upon by emergency services to provide assistance during the major flood alert on the evening of Tuesday 1 February 1983—ironically 30 years to the day since the birth of Raynet, through almost identical circumstances.

During the evening the effectiveness of the group's alerting procedure was tested and proven—as was our highly effective union with Breckland Land-Rover club's Rover Rescue—without whom we could not have provided an effective service. At 6.30pm, at the request of HM Coastguard, and in conjunction with the county emergency planning office, six Land-Rovers, each with a Raynet operator, were despatched to potential trouble spots around the coast from Hunstanton in the west to Southwold in the east. They were linked via the area controller, G3HRK, at North Walsham, to another Raynet station established at the Maritime Rescue Co-ordination Centre, Great Yarmouth. As a result of this link, coastguard officials were able to monitor the tidal situation as it progressed along the coast.

By 8.50pm, as the dangers of flooding became reality at several coastal resorts, including Walcot and Great Yarmouth, many more volunteers from both organizations were called upon by the police to provide emergency radio communications and rescue facilities, some working until 1.30am, only to resume activities the following morning on behalf of the police.

The final count revealed that 23 Rover Rescue Land-Rovers, various other vehicles and Raynet stations—mobile, portable and home-based, participated throughout the alert—and without one reported technical hitch! The police and coastguards publicly expressed their grateful thanks and praise for both organizations. □

SWL NEWS

Bob Treacher, BRS32525*

14MHz beacons

Listeners may be aware that a number of beacons now operate on a frequency of 14·100MHz. A private group in the USA has funded a chain of eight beacons, which operate sequentially. The beacons are as follows:

Time	Callsign	Location
XX.00	4U1UN/B	New York
XX.01	W6WX/B	Stanford, CA
XX.02	KH6O/B	Honolulu
XX.03	JA2IGY	Tokyo
XX.04	4X4TU/B	Tel Aviv
XX.05	OH2B	Espoo
XX.06	CT3B	Madeira
XX.07	ZS6DN/B	Transvaal

Each beacon transmits in sequence for 1min, every 10min, thus 4U1UN transmits on the hour, and at 10, 20, 30 minutes etc past the hour. The message sequence is as follows, with a progressive reduction in power levels: 100W—"QST de (callsign) beacon"; 100W—nine second dash; 10W—nine second dash; 1W—nine second dash; 0·1W—nine second dash; 100W—"SK (callsign)". Antennas are single element quad loops. The Northern California DX Foundation would like reports on the beacons in order to evaluate the performance of each of them. This is an area where listeners can perform a very worthwhile service, and it is hoped that as many of you as possible can send details of signal strengths, power levels heard etc, over a period of, say, several weeks. Reports should be sent to A. Lotze, 46 Cragmount Avenue, San Francisco, California 94116, USA.

Lower frequency challenge

I am very pleased to report that the challenge set for January was a considerable success. Fourteen entries were received, and most entrants felt that a challenge on the lines of the one set was a superb way to improve on one's all-time countries score, and at the same time, a first class stepping stone to a good low band score for the year.

January 1983 seems to have been good for dx on the 7 and 3·5MHz bands from the entries received. The best entry came from overseas—Jean Jacques Yerganian, ONL383, amassed 633 points from a total of 237 countries on all three bands, and wins the prize that was offered. In second place was Eric Carling, who scored 577 points from 233 countries. The best entry from a listener with an RS number greater than 50000 was received from Andy Smith, BRS50134, who had 487 points. The full list of results is as follows:

		COUNTRIES HEARD							
	SWL No	7MHz		3·5MHz		1·8MHz		Total	Mode
		EU	DX	EU	DX	EU	DX	points	
1.	ONL383	51	47	49	59	25	6	633	ssb/cw
2.	E. Carling	48	53	49	57	24	2	577	ssb
3.	BRS32525	40	51	49	51	22	3	550	ssb
4.	BRS25429	43	39	52	52	24	4	548	ssb
5.	BRS50134	41	39	47	44	24	2	487	ssb/cw
6.	BRS52543	44	40	51	52	19	1	481	ssb
7.	BRS44395	33	25	35	16	27	1	341	ssb/cw
8.	BRS31440	35	24	39	22	20	1	327	ssb/cw
9.	ONL-6945	33	25	45	41	0	0	274	ssb
10.	BRS18529	30	11	47	25	16	0	265	ssb
11.	ONL-620	27	13	34	18	0	0	154	ssb
12.	BRS62088	17	7	30	17	3	0	134	ssb
13.	ONL-6246	14	4	22	11	3	0	96	ssb
14.	OE1-109976	10	0	24	12	0	0	70	ssb

An analysis of the logs shows that on 7MHz a total of 135 countries was possible (84 DX, 51 EU). The maximum on 3·5MHz was 132 (81 DX, 51 EU), while on 1·8MHz 42 countries were heard (8 DX, 34 EU). This made the maximum on all three bands 309, which in one month is quite a startling figure. Last month's *SWL news* gave a fair insight into the dx that had been available, but to make this report fairly comprehensive the best dx listed on all three bands is as follows: **7MHz**—A71, AP, C53, C6, FB8X, FK8, FM7, FP8, FY7, HH, HK0, HL, HZ1, J28, J73, J88, JA, KL7, LU5ZA, ST2, SU, TT8, TZ, V2A, VP8, VU, XT2, YB0, ZD7, 4S7, 4K1 (Antarctica), 5Z4, 9L1 and 9X5. **3·5MHz:** A71, A92, AP, DU, FK8, FS7, FY7, HH, HZ1, JD1 (Ogasawara), J73, J88, JT1, KH6, ST2, TL8, UM8, V2A, V3, VS6, XT2, YB0, ZD7, ZS3, 6Y5 and 9X5. **1·8MHz:** The eight dx countries reported were: ssb—EA8, VE, W, YV, 5N8; cw—UA9, VK6 and 4Z4. A more full breakdown on the event can be obtained by sending an sae to your scribe at the address shown below.

*79 Granby Road, Eltham, London SE9 1EH.

1983 HF COUNTRIES TABLE

(Starting score 150)

Station	28	21	14	7	3·5	1·8	Total	Mode
BRS8841	88	112	134	85	100	30	549	ssb/cw
BRS48909	95	97	111	85	76	19	483	ssb
BRS1066	63	68	70	73	55	34	363	cw
BRS31440	52	53	28	65	64	24	286	ssb
BRS44703	72	44	22	23	81	23	265	ssb/cw
BRS49327	44	62	5	36	32	8	234	ssb/cw
BRS25429	0	0	0	82	104	28	214	ssb
BRS52543	0	0	0	84	103	20	207	ssb
BRS50134	0	0	0	80	91	26	197	ssb/cw
G6TEP (ex-BRS35509)	38	31	30	33	58	2	192	ssb
ORS46084/7Q7	42	36	63	6	4	0	151	ssb

CQ 160

The last weekend in February is now established as the weekend when 1·8MHz is full of stations trying to work or, in the listeners' case, hear some new countries on ssb. It is of course the CQ WW 160m SSB Contest. Dave Whitaker, BRS25429, and I spent over 16h monitoring the band during the contest and we managed to pick up one or two new countries. Conditions until 0700 on the Saturday morning were very ordinary, with no dx heard until 0618 when AB1A was heard. Between us, four W1s, two W2s, two W4s, one W8 and a VE3 were copied until the band closed at around 0700.

Saturday evening provided some reasonable dx in the shape of RA9AKM, 4X4NJ, 5B4EP and 5B4JE, plus the now regular signals from LX1PD, LZ1KDP and several EA6s. Best European dx logged was UO5ODB at 0046 and FC6KSC at 0107. KV4FZ was very good copy at 0140 but the skip seemed to be one way, as the Europeans could copy the KV4 but not vice-versa. Dave found the best conditions between 0500 and 0700 on Sunday morning, logging YV3AZC, plus 30 assorted Ws and four VEs. Unfortunately conditions did not seem to favour the Caribbean, which was a pity, as stations from HH2, PJ, VP2 and 8P6 were all apparently active. I have sent a scored check log to *CQ*, asking whether they would be willing to include an swl section next year. The contents of the reply will be passed on in due course.

HF activity

With everyone looking for the two VK0 Heard Is dxpeditions, but not being very successful in logging them, many listeners spent more time on the higher bands. Robert Small, BRS8841, got VK0NL and VK0CW on 7MHz cw, and VK0CW, HI and JS on 14MHz ssb and cw. BRS62088 managed VK0JS on 21MHz ssb, while Paul Crankshaw, BRS48909, and Dave Whitaker, BRS25429, both reported logging the expedition on 14MHz ssb. Your scribe had a tip-off about VK0JS being on 28MHz ssb at 0845 one morning, but unfortunately the lack of a directional beam antenna meant that VK0 (Heard Is) is still a wanted country on 28MHz at this QTH. Conditions certainly did not favour G-land, for example on 28MHz band conditions in VK0 were equivalent to those we experience in August. However, although both groups were unhappy about making so few contacts—VK0CW made around 23,000, and VK0JS made around 15,000 QSOs, when both expected well in excess of 50,000—it is pleasant to know that so many were successful. As both groups have obviously lost money on the trip, do not forget to enclose one or two extra ircs when asking for a direct QSL. Listener reports will probably be gratefully received. As conditions were poor the groups will be interested to hear exactly where and when their signals were being received, and how strong they were. On behalf of all British swls, I would like to thank both groups most sincerely for their efforts.

While monitoring the bands for Heard Is, many caught up with FB8ZP on both 28 and 21MHz, and with FB8XAB on 14MHz. G4LJF/3B8 was very active for a fortnight in February, especially on 7 and 28MHz, and his manager G4DYO will be pleased to QSL all accurate listener reports. Brad managed to catch LU3ZI (South Shetland Is) on 28, 21 and 14MHz cw, while Brian Wainwright managed to log 4S7OM (via DF5UG), and TL8ER on 21MHz. BRS62088 strayed long enough from 14MHz to find several new countries on 28MHz, in the shape of A99A, operating from the Middle East Telecommunications Exhibition (QSL via the A92 bureau), and A71BH. Robert, BRS8841, had been concentrating on the cw end of the higher frequency bands as his cw is fast improving. FR7CA on 14MHz, FB8XAB and FB8ZQ on 21MHz, and 5X5FS (via EI9G), TT8AD and UH8EAD were all new for him on 28MHz. Back to 7MHz, cw yielded J28DP, V3HE, HH2VP, A4XJP and VS6DO. Robert wondered when he would log his next all-time new country. With S21JA and PY1EFM/PY0 (Trindade) imminent at the time of writing, and rumours of expeditions to 5R8, St Peter & Paul Rocks, and Malpelo Is in the air, and VE7BC likely

(Continued on page 339)

THE MONTH ON THE AIR

John Allaway, G3FKM*

TWO MORE instances of the illegal use of other peoples' callsigns have been noted—G3CNY has been receiving QSL cards for contacts allegedly made with the USA on 14 and 3·5MHz. G3PSP is also having problems and is receiving cards for spurious contacts on 10, 14 and 21MHz cw—in this case the operator gives his name as Jack and location Bristol.

WB4NND has asked, through G4FLO, for information on the present whereabouts of A4XGZ, for whom he acts as QSL manager, as he still has many contacts to confirm.

RSGB QSL Bureau manager Ted Allen says that all mail addressed to the Ghana Amateur Radio Society at PO Box 3773, Accra, is being returned to the bureau marked "Unclaimed". This may explain why some people are waiting for 9G1 confirmations, and any explanation would be welcome.

DX news

The Sierra Leone ARS has announced that it will be holding an hf field day weekend commencing 0900 9 April and continuing until 0900 10 April. Operation will be on phone only, and activity will centre around 7,060, 14,310, 21,360 and 28,600kHz. Callsigns to be used are 9L1FD, 9L2FD and 9L3FD, and QSLs go to WA0CAE (see "QTH Corner").

The most recent IARU Calendar lists the following countries as having permission to use 10MHz: A2, A3, DL, DU, EA, F, G, H4, HB, J2, JA, LA, LX, OA, OY, OZ, P2, PA, PJ, PZ, VE, VK, W, XE, YB, YK, ZF, ZL, ZS, 4X, 5N, 7X, 9H, 9L and 9M. In most cases the band is also available in overseas possessions of the countries listed. The same publication says that A2, A3, A4, DL, F, G, HB, J2, LA, OA, OY, OZ, PA, VK, YB, ZF, ZS, 4X, 5N, 7X and 9L are now authorized to use 18 and 24MHz.

DXpress says that VE2DVG/YK commenced operation in February and was likely to be in Syria for six months. Operating frequencies are 3,503, 3,795, 7,003, 7,072, 14,020, 14,120/220, 21,020, 21,295, 28,020 and 28,595kHz. YK1AO is often to be found on 14,220kHz or between 14,235 and 14,245kHz at 1400.

JW5NM and JW8KT will be in Svalbard until 1985. Operating patterns are as follows: JW5NM on 7,005kHz from 0100 to 0400, as well as 30kHz above lowband edges on 14, 21 and 28MHz cw. SSB frequencies are 7,080, 14,205, 21,305 and 28,505kHz, and 3·5MHz operation takes place on request. Other active stations include JW1UW, JW5VAA, JW6MY, JW4FD and JW4GN.

It is believed that the ITU has now allocated HL and D7A–D9Z to South Korea, and HM and P5A–P9Z to North Korea. Amateurs in France have been using the TØ prefix instead of F to celebrate World Communication Year. T42AMC was located in Cuba and using the T4 prefix for the same reason.

DJ9ZB is still producing his QSL information bulletin (10 issues per annum). This costs DM22 a year from F. Langner, Carl Kistnerstr. 19, D-7800 Freiburg/Br, FR of Germany. DL8BL also produces a QSL list which gives managers from 1978 to the end of 1982. This costs DM15 from A. Maurer, Beim Weisenstein 9, D-6602 Dudweiler/Saar, FR of Germany.

D68AR has been on the air from the Comoro Is. He has an Atlas 210X and beam, and is to be found in the French part of 14MHz in the late afternoons. FB8WH and FB8WI are also occupants of the same part of the band at that time, and have also been on cw after 2300 between 14,005 and 14,035kHz. They will be there for a year.

5V7HL keeps a regular schedule with N5ADC near 14,290kHz at 2200 on Sundays. ON6BC/C9 has been active from Mozambique; at the time of writing he had no written permission but was hopeful of obtaining it. I6VDE/C9 was also unlicensed. Anyone looking for a contact with Liberia on 3·5MHz might seek EL2AD who works near 3,795kHz on most days and has been QSOd around 2100. KC7UU/5N6 will be in Nigeria for some time and hopes to visit Togo and Tchad. TR8JD will be in Gabon for two years. He has an IC730 and TH3 with verticals for 3·5, 7 and 10MHz, and tends to operate near 7,004, 7,048, 7,060, 10,104, 14,010, 14,300, 21,010, 21,300, 28,010 and 28,600kHz, between 1130 and 1330 and again from 1900 to 2100. Other active TR8s are TR8DX, TR8GM, TR8IG, TR8WR and TR8CR. TJ1CK has closed down and TJ1GH is due to leave Benin in September, leaving the country without amateur representation.

Tim Chen, BV2A/B, says that the Taiwan licence is being revised and that there may be more activity from BV soon. BY1QH may be the third Chinese station to come on the bands, KC2HQ may be on from Ogasawara this month—he will be on cw and ssb on all bands 3·5 to 28MHz.

VK0RC, VK0RE and VK0AS are all active from Antarctica until November. DP0AA is active from Neumayer Base, Antarctica. VK9ZJ is the new operator on Willis Is. Willy de Roos, VK9XR/MM, on board the yacht *Williwaw* is moving around the South Atlantic and has already visited the Argentine and Adelaide Is. VP8ANA is located on South Georgia and is operated by two biologists from the USA. G4DNV was supposed to move to South Georgia and stay for the 1983 winter, but reconstruction may not have permitted this. VP8AOB and VP8AQU are on South Orkney and share the use of a transceiver on alternate nights.

The 14,100kHz beacon at Stanford is now signing W6WX instead of K6OPO. Other hf beacons are 18,110kHz at 0100 on Mondays, Wednesdays and Fridays, and on 24,900kHz at 2000 on Saturdays and Sundays—callsigns are KK2XJM, KM2XDU, KM2XDW and KM2XKO and transmissions consist of continuous carrier with voice identification.

Top band

More information on allocations in other countries has been received via G4GKO/4X and PY2ERA. In Israel 1,810–1,850kHz is available on a shared basis with other services, and a maximum dc input power of 100W; from 1,850 to 2,000kHz the amateur service is on a secondary basis and power input limited to 10W. In Brazil 1,800–1,850kHz is available.

More additions to the lists of "Firsts" published in March 1982 and January 1983:

D2DI—G3LP (19.3.46)
HB9CM—G3CFV (6.3.66)
OE5KE—G3CFV (17.12.66)
OH3NY—G3CFV (1.3.64)
OH0AM—G3CFV (25.10.69)
VO1FB—G3CFV (9.1.65)
VP9GJ—G3CFV (28.9.69)
K1PBW/8—G3CFV (8.3.69)
9L1HX—G3CFV (18.1.65)

DX News-Sheet reports that JW5VAA is now active on most days on 1,837kHz at 2200, but at the time of writing he had only heard Scandinavia. XT2AW has been working into the UK on 1,828kHz around 2200, and is also on the band at 0600 near the same frequency at weekends.

VK6HD found conditions this winter not as good as last although there have been some very good openings. It seems that 1,801 and 1,807kHz are now covered by rtty in Europe, and Mick has been listening between 1,819 and 1,821kHz and on 1,849kHz. UK stations worked include G3BDQ, G3FPQ, G3KMA, G3KMO, G3JMJ, G3MLO, G3MOU, G3RBP, G3SZA, G4AKY, G4DYO, GD4BEG, GM3ZSP and GW3YDX. Heard and called but not worked were G2FFO, G3RFS, G3RTY, G3XWZ, G3ZFC and G4JGV. Mick is working towards his 1·8MHz DXCC and only needs another 20 or so countries.

An amendment to the table of 1·8MHz allocations given in February *MOTA*—**Austrian** amateurs are now allowed to use 1,810–1,830kHz on a secondary basis with A1A only, in addition to the 1,830–1,850kHz segment. They are hoping to acquire a small segment for telephony in the 1,832–1,834kHz area similar to that in the FR of Germany.

Overseas news

Ron Radley, G4ABI (ex-9G1GE, 9J2GE and G4ABI/W2), is now active from the Sudan signing G4ABI/ST2. Initial operation from February was with an HW8 and groundplane antenna, but a TH7 beam was on order and he was hoping to return after leave in March with his main equipment. It is hoped, as usual, to stick mainly to cw and give as many stations as possible a chance to work the Sudan on the key. Contacts with old friends from Ghana and Zambia would be most welcome, as would of course those with the many friends in the UK that Don has made during his years dxing from Africa. QSLs should be sent to the address in "QTH Corner".

Readers searching for the QSL address for 5H3FN will find it in this month's "QTH Corner"—apologies Eric! Apparently cards are being received via a Cairo QTH that Eric left six years ago and it does seem that a lot may have gone astray.

G4HKA has received a letter from WA4JQS which reads as follows: "Please inform *Rad Com* for me that I am QSL manager for the following: VP8QG, VP8QJ, VP8NJ, VP8PU, VP8WA, VP8ZV, ZS1DM, PY5YL and TA2TAT. IRCs and self-addressed envelopes are required—no QSLs are answered via the bureaux as they have orders to dispose of all incoming cards with the exception of swls and UAs. Look for me on 21,355kHz plus or minus, 0000 Sunday with the VP8s."

M1V has supplied more information on the new callsigns of San Marino

*10 Knightlow Road, Birmingham B17 8QB

stations which have come about as a result of the recent prefix change. M1s B, C, D, H, I, J, V, Y and W have first-class licences and will change their current "M" to "T77". M1BS will become T77S. The T72 prefix will be used by second-class (vhf and above) licence holders, and T71A to T71Z by first-class licence holders for special events. T70A is the club station "Corrado Francini"—a memorial to M1A, and the first use of the call will take place for a 24h period beginning 1300 on 20 April. The activity will be on cw, ssb and rtty, and a special QSL card with first day stamp of the WCY will be available to those who make a contact. QSL to the address in "QTH Corner".

SP3AGE is seeking copies of books on antennas such as "All About Quad Antennas", "Antenna Anthology", the "ARRL Antenna Book", "Practical Antennas for the Radio Amateur", or others. He is able to offer Polish stamps in payment and anyone who can help is invited to write to W. Kuiigowski, ul. Zeromskiega 6 m 2, 78-600 Walcz, Poland.

Officers of the MARL Amateur Radio League for 1983 have been announced as Carmel Fenech, 9H1AQ, president; Walter Gatt, 9H1DU, hon secretary; Tony Vella, 9H1FG, treasurer. Other officers are 9H1GL, 9H1GN, 9H1O and 9H1ES.

Expeditions

F6FDK will be in Chile this month and hopes to be active from Easter Is. Most likely times to find him are between 1600 and 1900 on 14,120 or 21,210kHz.

Jacky, F6BBJ, should be on holiday in Africa now, and was due to begin operations from TR8 in mid-March. He is looking into the possibilities of trips to S9, 3C1, 3C0 and TJ. TR8JD may accompany him, and likely frequencies to be used are 3,505, 3,792, 7,002, 7,075, 14,045, 14,195, 21,045, 21,295, 28,045 and 28,545kHz. QSLs (and donations) should be sent via F6AJA.

VK3AWN and VK3KHI were scheduled to be on as T30CX from 24 March to 8 April, and then as 5W5EB until 16 April.

1983 28MHz countries table

Updated totals are as follows: G3KDB (82, cw only), G3XBY (78), G4PKP (49), G4OBK (36), G4EHQ (24), and G3XBM (18).

Welcome

To the following who joined the Society during January: CO2HQ, DA2RT, EI2EP, EI7AMB, EI3BTB, F6BBJ, IW3AEJ, LA6VBA, OE3LI, SK0CT, SM6EAN, SV5OX, WA3WHR, W0QT, ZB2HD and 3B8FJ. New listener members include J. Bloch (4X), J. Le Carpentier (F), M. Murphy (EI), P. Vivian (ZS), G. Gerbracht (W), J. Seyghal (EA) and C. Steer (F).

Contests

Helvetia Contest

1500 23 April to 1500 24 April

1·8 to 28MHz. Phone and cw—a station may be worked once per band but only on one mode. Exchange RS/T and serial number with Swiss stations, who will also indicate their canton by sending a two-letter code. There are now 26 cantons: AG, AI, AR, BE, BL, BS, FR, GE, GL, GR, JU, LU, NE, NW, OW, SG, SH, SO, SZ, TG, TI, UR, VD, VS, ZG and ZH. Each QSO is worth three points, and the multiplier is the total number of cantons worked on each band added together (maximum = 130). Indicate new cantons in log and include summary sheet giving details of scoring and full name and address in capital letters as well as the usual signed declaration. Logs must be posted before 23 May and sent to: TM USKA, K. Bindschedler, HB9MX, Strahleggweg 28, 8400 Winterthur, Switzerland. A reminder that this contest is an excellent way of working the rarer cantons for the Helvetia 26 Award (see "Awards").

The CQ M Contest

2100 7 May to 2100 8 May

3·5 to 28MHz. CW and phone—stations may be worked once on each band either on cw or ssb. There are single-operator single- and multi-band, multi-operator single-transmitter, and listener sections. Exchange RS/T plus serial number. USSR stations will also send their oblast number. Contacts may be made with all countries, and one point is made for those with one's own continent and three with others. Own country may only be worked for multiplier credit. The multiplier is the number of countries worked on each band added together—the R-150-S list being used for this purpose. This is essentially the DXCC list plus oblasts 002, 013, 014, 056, 084 to 098 inclusive, 159, plus Novaya Zemlya, the Kuril Is, and New Siberian Is. Listeners gain one point for logging one station exchange and three for logging both. If previous practice is followed badges will be sent to all those making more than 10 USSR QSOs. Contacts made during the contest may be used for credit when applying for the various USSR awards provided that they are applied for when the log is submitted. Post entries before 1 July to Krenkel Central Radio Club, "CQ M" Contest Committee, PO Box 88, Moscow, USSR.

CARF Commonwealth Phone Contest 1983

1200 9 April to 1200 10 April

3·5 to 28MHz, ssb only. Single-operator single- or multi-band categories. Exchange signal report and serial number (from 001). Work stations outside own Commonwealth call area—each station may be worked once per band, and each QSO counts five points. A bonus of 20 points may also be claimed for the first, second and third contacts with each Commonwealth call area on each band. Suggested operating frequencies are 3,600, 3,760, 7,080, 14,130, 21,200 and 28,480kHz plus or minus 20kHz. Entries should include log and duplicate sheets, checklist of call areas worked on each band, and a summary sheet showing claimed bonus points and final claimed score calculation. Summary and call area checklists are available from the sponsors (*not* G3FKM) in exchange for an sae. Mail entries within a month of the contest to: CARF, PO Box 2172, Station "D", Ottawa, Ont, K1P 5W4, Canada. A plaque will be awarded to the top-scoring all-band entrant, and certificates to high scorers in each class in each Commonwealth call area.

In the **1982 IARU Radiosport Championship**, UK scores were as follows: (CW) **G4GIR** (483,912), G3KDB (196,868), G3XTT (173,221), G3SXW (151,028), **GJ5EMB** (94,450), G3ESF (67,600), G3TXF (51,686), G5CFJ (44,768), G4MVA (25,440), **GW3MPB** (24,500), **GM3RAO** (21,489) and G4BUO (19,173). In the phone section **GM4HQF** scored 37,290 points and **G5EBA** 14,421.

Awards

H26 Award

Awarded to those who have confirmed contacts with all 26 cantons or half-cantons made since 1 January 1979. QSLs submitted must clearly indicate the location of the Swiss station at the time of contact. Applicants must send their QSLs plus a signed list showing date of QSO, callsign and location, date and time, frequency band, and class of emission used, to Walter Blattner, HB9ALF, Postbox 450, CH-6601 Locarno, Switzerland. Endorsements for all cw, all phone, mixed modes, rtty, and sstv are available on request. Note that QSLs must be submitted—the RSGB Awards Manager cannot certify the validity of claims. There is no charge for the award, but it is suggested that a few ircs are enclosed to cover the cost of postage on the award and returned QSLs.

Horndean & District ARC Award

Requires contact with (or confirmed reception of) 10 members of the club (on vhf this number is 15). A copy of the rules and list of members can be obtained by sending an sae to Johnathan Kay, G6DWT, QTHR.

Worked All Winnipeg Award

Sponsored by the Winnipeg ARC. Non-VE4s require confirmed QSOs with 10 stations in the metro-Winnipeg area (on any band or mode) since 1 January 1965. Special seal endorsements are available for 10 additional QSOs since 1 January 1971. Send log data plus four ircs to Awards Custodian, Gil Frederick, VE4AG, 130 Maureen St, Winnipeg, Manitoba, R3K 1M2, Canada.

4X4 Award

Available to those who have 16 contacts (or confirmed reports) with stations in Israel on four different bands since 1948 (any mode/s).

Israeli Award

For contacts/reports since 1 January 1982; 25 points needed—below 10MHz QSOs count two, above one. For this and the previous award send list certified by a national society awards manager (G3KDB in UK) plus US $1 or equivalent in ircs to Award Manager, IARC, PO Box 4099, Tel-Aviv, Israel, 61040.

Introduction of Rainbow Trout to NZ Award

Sponsored by Branch 60 of NZART to mark the celebrations in Taupo during the period 13 to 23 April when the area will be marking the 100th anniversary of the introduction of New Zealand's sporting fish. Three contacts must be made during the period mentioned, all with stations near Lake Taupo, and a station may be worked on more than one band for credit. Send log extract and NZ $1 to Centennial Award, Box 910, Taupo, New Zealand.

USA Counties Award

Colin Howell, G4LJU, has kindly offered to help members working for this attractive award. He has a recent copy of the USA National Zip Code & Directory of Post Offices, and if he is sent details of addresses, states, and

zip codes, plus a stamped sae, he will be pleased to supply the county information. Colin is QTHR.

JARL Awards

Please note that the fee for each award issued by JARL is now eight ircs. An additional two ircs will be charged for airmail delivery regardless of the number of awards claimed. If QSL cards are submitted, sufficient funds for return postage will also be required.

Around the bands

The latest view of Cycle 21 as seen through the eyes of G8KG is as follows: "Mean solar activity has fallen steadily since the beginning of the year. The provisional SIDC sunspot number for February was 50·1 and was the lowest value since January 1978, while the 27-day average solar flux, which started the year at 198 sfu had fallen to 122 by the end of the month, the lowest since mid-1978.

"Daily flux readings fell below 100sfu on several days during February, including the weekend of the ARRL CW DX Contest. Not surprisingly conditions on 28MHz were very marginal when compared with recent years, but this was balanced by some excellent conditions on the lower bands, notably 7MHz, prior to the magnetic disturbance on the second day.

"It rather looks as though we are at present in a phase in which the actual solar activity is running quite a bit below the average expectation for this stage of the cycle. This is by no means unusual and we can expect after some months that we shall have some above-average conditions; always remembering, however, that the underlying trend is now downwards for at least three more years."

GM3HBT has noted the "weekend effect" on 18MHz and has been giving the band considerable coverage by putting out "CQ" calls when it is apparently empty. This way he has worked 12 countries, and he suggests that more of us transmit instead of just listening and hearing nothing!

Thank you to the following for sending in logs: G2HKU, G5JL, G5MY, G5CFJ, G3s AAE, GHY, GIQ, GVV, GM3HBT, G3s IMW, KDB, KSH, LPS, XBY, YRM, G4EHQ, GW4KGR, G4s LDS, OBK, PKP and RS1066.

As usual, stations listed in italics were using A1A.

1·8MHz. 0000 *EA6, EA8, EA9, OZ, PA, UA3, UQ2, UB5, ZB2, 4X4DX.* **0100** *N5JJ, NA5R, RA9AKM.* **0200** *KV4FZ, UA6YAF.* **0400** *NP4A.* **0500** *PY1ZAE, WA2SPL, W1,4,5,8,9.* **0700** *W1MX, W3AJS, K8JK, W9RE.* **2200** *ZB2EO, 5Z4CS.* **2300** *EA6JD,* LX1PD, *UA9SJR, UM8MBA.*

3·5MHz. 0000 *HH2VP, 4K1D, 5T5TO, 5N8ARY.* **0100** AP2ZR, *J28DP, W2BBK/PJ7, UJ8AH,* KP4DEX/V2A, *K8WW/VP9.* **0600** C53CR, D44BC, J88BC, *XT2AW,* 6W8AR. **0700** CP1IL, FG7CB/FS, *VP5FUX,* WB7RGN (Wyo), *ZL1AMO.* **0800** XE3RT, ZL2RY, ZL4IE. **1700** VK7AE, *9K2BE.* **1800** 6W8DY. **1900** *CT2DG.* **2000** A71AD, *G6ZY/EA6, JH3BFG, UA0WAE, VK2OI.* **2100** *A6XWT,* HZ1AB, VO1CU, ZS4PB. **2200** G3ZGC/J6L, JA6IEF, DF3NZ/ST2, TL8CK, VK6LK. **2300** *CN8CO,* KM1R, KR2N, VE1DX, *VU2BK,* YK1AO, *7X4AN.*

7MHz. 0000 *FB8XAB,* ST2FF, DF3NZ/ST2, *VK0JS, VP2MIX, VU2BK, 4K1D.* **0100** *FP8HL, V2AS, 4K1CR.* **0200** *DJ1JW/HP1, F0RG/TJ, VP2ES.* **0300** *HH2VP.* **0500** *J87LTA, LU4ZI, W2BBK/PJ7, W7IUV* (Ariz), *XT2AW.* **0700** *W6, ZL.* **0800** *A7CIX, CP8HD,* CE3DOF, *KL7Y, VK2, VK3, ZL2LV, 9Y4VU.* **0900** *JA1, JA5CZE, N7RM, W1,2,3,4,8, 8P6J.* **1700** *VK6ANE,* G4LJF/3B8. **1800** A4XCA, *VK0CW.* **1900** ON6BC/C9, ZL1AQB. **2000** *W6KG/A7, VK3MR, VK0JS, ZS5LB.* **2100** *UA0LCZ, VP9DR.* **2200** *JA5IU, JH7BQL,* JY9RC, 5Z4NN. **2300** HZ1AB, *5N8ARY.*

10MHz. 0100 *W1BIH/PJ2, W2KN/PJ7.* **0700** *JA8XR.* **0800** *DL9AD/EA8, LX1YZ, VE8JP, VK2,3,4,5, ZL1-ZL4, 3V8AA, 6W8HL.* **0900** *JA2EPW, KV4CI, VE3ACH, ZB2GR, 4U1ITU.* **1300** *DK7PE/HB0.* **1800** *FC9VN, TT8AD, ZL1AH, ZL3BJ, DJ0JV/5N4.* **1900** *TU2GA, VE2FOU/MM* (off A9), *ZS6BXI.* **2000** *J87LTA, KV4CI, VK3MR, G3KTR/5N9, 9J2BO.* **2100** *C31IU, C6ABA, FG7BG, FM0FTP, HZ1HZ, G3ZGC/J8, PJ2MI.* **2200** *VP2s EU, EV, K4FW/VP2* (Nevis) *XT2AW, YV21F.* **2300** *HK1QQ, 5Z4CQ, 8P6AU.*

14MHz. 0700 KC7UU/5N6. **0800** TA5RV/FC, *HL4XM,* VS5GA, *ZL.* **0900** *G5CW/EA8,* KH2DG, VR6TC. **1000** *FY7BO,* KL7VZ. **1300** *VP2ES,* all W (except 6). **1500** TA8MSC, 9N1MM. **1600** A92NH, *N0ZO/DU2,* KH6BB, *PA0FRI/OD,* 9M2FK. **1700** FB8ZP, FB8WH, *FG7AS,* FR7BT, TL8ER, TT8BC, *VK6s, VK0CW,* VK0HI, VK0JS, *3B8FK,* 3B8DA/3B9, 3V8PS, 5R8AL, *9V1TL.* **1800** A71AD, *KH6IJ,* ZD9BX, 5X5FS. **1900** *FY7YE,* J39BS, ZD7HL. **2000** C53DF, JW4GN (Bear Is), *F0TG/TJ,* VP8MT. **2100** *LU3ZI, ZD7WT.* **2200** ZL2FA. **2300** J28DM, PY1EFM/PY0.

18MHz. 1600 *EL0BY/MM* (off W6), *DL2GG/YV5, ZL1VM.*

21MHz. 0800 HL2AKS, *J28DM,* JA, JD1BBG, VK. **0900** *BY8AA,* D44BC, JA, JD1YAA, *NL7J,* VK, ZL. **1000** VK0HI, 7P8CL. **1100** AP2P, TT8AD, VK0JS. **1200** TL8CK, VP5FUX, G4LJF/3B8. **1300** *G4DUW/DU1, FB8ZQ, VK6, VS6KH,* W2,3,4,5,8,9. **1400** FM7BX, FY7CH, HR3JJR, *VK0CW,* VK0HI, ZF2AO, 5K0LR (S Andres), 9K2CX. **1500** TT8AC, *VP5MOX,* 9L1DR. **1600** *K4FW/VP2,* 9U5JM. **1700** EA9NK, HC8GI, *LU3ZI,* VE5-VE7, W6-W7, 5R8AL. **1800** *ZS6BPJ/3.* **1900** G4AVW/ST3, ZD9BV, 5H3BH.

24MHz. 1000 *VK6RO.* **1200** *VK6AKG.* **1400** *DL.* **1500** *C6ABA.*

28MHz. 0800 A99A, FB8ZP, *TR8IG.* **0900** *J28AG, JA,* FH8CB, FR0FLO, VK0JS, *VS6BQ,* 9L1DR. **1000** A71BH, C53AP, D44BC, F8HB/EA6, VU2AID, 5N0ATW, *9H1CH.* **1100** A6XWT, *FB8ZQ,* 7Z2AP, 8Q7AV, 9N1MM. **1200** W6KG/A7, FH8CB, FR7CA, UJ8JKO, ZD7WT, *3B8FK.* **1300** CE8ABF, *J28DP,* V2AS, Z21GN, 5X5FS. **1400** J87LTA, LU3ZI, PY, *VP2EAA,* VP5WJR, W1-W5, YB0ACL, *YS1LSR,* LA2EX/3X, 5T5AP. **1500** A4XCB, TL8DC, VP5FUX, VP8AIB, W6, *W7KSA, K8MM/VP9.* **1600** *EA9JG, HH2VP, DJ1JW/HP1,* T4AMC, *TT8AD, V3HE, W7AYY.* **1700** *CM2CL,* S83H, *VP2ES,* W7 (until 1900). **1900** *W1BIH/PJ2, KK0M/6.*

Thanks to all correspondents, and to the following publications for information extracted: *Lynx DX Bulletin* **(EA2JG/EA3CBQ)**, *DX'press* **(PA0GAM)**, *CQ Magazine* **(W1WY)**, *DXNL* **(DL3RK)**, the *DX Bulletin* **(K1IN)**, the *Long Island DX Bulletin* **(W2IYX)**, *DX News Sheet* **(G3XTT/G3ZAY)**, the *Ex-G Radio Club Bulletin* **(GI3OEN/W6)**, and *Long Skip* **(VE3EUP)**.

Please submit items for the **June** issue **to reach G3FKM** no later than **28 April**, and for **July** no later than **26 May**. □

QTH CORNER

W6KG/A9	YASME Foundation, Box 2025, Castro Valley, Cal, 94546, USA.
C53CR	J. Rosenstock, PO Box 2282, Serrekinda, via Banjul, The Gambia.
J87LTA	K4LTA, 101 Baylor Drive, Oak Ridge, Tenn, 37830, USA.
KC6SZ	JA6BSM, M.Cho, 12 Harumachi, Kasuyacho, Fukuoka, Japan.
G4ABI/ST2	D. Radley, c/o PO Box 974, Khartoum, Sudan.
T2AWN	(see 5W5EB).
T30CX	(see 5W5EB).
T70A	Box 1, San Marino City, 47031 San Marino.
TT8AC	N4NX, W. T. Barr, 305 Alpine Dr, Roswell, Ga, 30075, USA.
TT8BC	K4PHE, R. Smith, 549 Southwind Drive, Lilburn, Ga, 30247, USA.
VK0CW, VK0HI	**(European QSLs)** via VK6NE, 388 Huntriss Rd, Woodlands, WA 6018, Australia.
VK0JS, VK0NL	HIDXA, Box 90, Norfolk Is 2899, S Pacific.
VP5XX	WB9TIY, K. Morehouse, 6 Hickory Rd. Hawthorn Woods, Ill, 60047, USA.
Y83ANT	Y44ZK, Box 176, DDR-6100 Meitingen, German DR.
1S3NG	DK9KD, PO Box 620260, 5000 Koln 60, FR of Germany.
1S6SI	DJ6SI, B. Drobinca, Zedernweg 6, D-5010 Bergheim, FR of Germany.
G4LJF/3B8	via G4DYO, 123 Reading Rd, Finchampstead, Wokingham, Berks RG11 4RD.
3D2RR	(see 5W5EB).
5H3FN	E. Newton, G3JCB, 4 Victoria Rd, Cogenhoe, Northampton.
5W5EB	VK3DAK, PO Box 6, Newport 3015, Vic, Australia.
8Q7JA	JA8MWU, Kazunori Abe, 7-12 Kagura, Asihikawa, Hokkaido 070, Japan.
9L1FD, 9L2FD, 9L3FD	Rev B. Frederickson, WA0CAE, 1366 E. County Rd, St. Paul, Minn, 55109, USA.

SWL NEWS

(Continued from page 336)

to be back in China soon, his answer might well be "sooner than he thinks"!

By the time this is read, the Portuguese will be using the CR prefix. 3A2EE is using the 3A3 prefix in 1983 (QSL via F9RM). All these special prefixes are in use as 1983 is World Telecommunications Year.

VHF activity

Dave Whitaker, BRS25429, provided more detailed information on the dx heard during the 21–23 January lift on 144MHz. New squares for him were AF, AE, AI, ZE, ZF, DH, BF, II, FK, HI, HJ, FI, GH and IJ, to take his QTH squares total to 135. During this lift 70 QTH squares were logged. Activity was not as hectic as normally experienced in a mid-summer tropospheric lift, but the quality was just as good. It is to be hoped that during the summer we will have more reports of vhf activity, as there really is much of dx interest on 144MHz.

Dave now has 71 QTH squares confirmed. His latest additions courtesy of OZ1GRF (HP), SM7MVR (IQ), OK1MBS (HK), SM6CMU (FR) and SM7LXV (GP).

Andy Smith, BRS50134, also sent a full report of the same conditions, but viewed from Guernsey. Six EAs were copied from XD square, plus HB9AEN/P (DG13b), and DL1GAL/P and DF2UU/P, both in EI22b. EI7BA was copied from Eire, but Andy was particularly pleased to copy EB1MS (XC03b).

News from overseas

Stan Porter, ORS45992, wrote on his return to 7Q7, but reported little activity due mainly to two new "toys" which he took back with him from G-land—a tv and a vcr. He caught the VK0 expedition and YI1BGD, HC8GI, TT8AC, T32AF, C21RK and 5X5FS. Shack redecoration is high on the order of jobs to do, and a photograph is promised when the job is completed. Stan passed on the information that 7Q7LW is back on the air after waiting for his licence to be renewed, and that a number of fresh licence applications had been lodged with the authorities. Perhaps that could indicate more activity from 7Q7 soon.

Here and there

G4IDF has indicated that he also would be willing to give QTH information to those requiring USA addresses, preferably by sae, but also between 1900 and 2100h on Monday to Friday on Worcester (0905) 20135.

Ex-A2111 is now well known as G3UML. He passed on one rule that all

listeners ought to keep to, and which will help to produce results. Tell the wanted station that you can hear him at a time when he would not expect to be audible at your location. It tells a ZL nothing if you hear him working many Gs on 14,180kHz at 0800, but if you tell the same station that he is audible in G-land at an unusual time when he is working another part of the world—say at 0100 while he is working South America—he has got to be interested, and will probably send you that all important QSL card. Other useful information which G3UML passed on is not to neglect the low end of 14MHz ssb around 1630. At the end of February, FB8W, X and Z, FR7, 3B8, 3B9, S79 and 5R8 were all audible.

Brad Bradbury, BRS1066, reported that he is now active on 24MHz with help from G3BFR, who put out a test signal to help him find the band. First impressions were that it was a very quiet band, with little activity. However, he had logged three countries—G, DL and VK6RO, on 19 February at 1004. Brad now has VK on all bands 3·5-28MHz, including 10, 18 and 24MHz.

Finale

News, views, and table scores for the June issue should reach your scribe by **Monday 18 April**, with short late items received by **Tuesday 27 April.** April traditionally marks the end of the winter dx season, but no doubt my readers will find plenty of interest to help provide a lively column. □

HF propagation predictions

Band predictions for April 1983

Using the table

The time is presented vertically at two-hour intervals 00(00)gmt to 22(00)gmt for each band.

The probability of signals being heard is given on a 0 (indicated by a dot) to 9 scale; the higher the number the greater the probability, with 1 meaning 10 to 19 per cent of days, and so on. Additionally 50MHz F-layer and 1·8MHz openings are indicated by a dagger (†) in the 28 and 3·5MHz columns respectively. The higher probability figures are printed in bold type.

	28MHz	21MHz	14MHz	10MHz	7MHz	3·5MHz
GMT {	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802
EUROPE						
Moscow	.....	...1344454..	1.2666677872	656544445798	874211112578	†4.....25†
Malta	.....	...14455551.	212777778984	877654456799	997422223589	††4.....25†
Gibraltar	.....	....1222241.	...377777883	654765556798	998642223589	†††3.....2††
Iceland	.....	.....1..	25566762	311365556787	876532223467	††52.....35
ASIA						
Osaka	.....	....2331....	...253234341	....2...2562	241	.....
Hong Kong	.....111....	...2455542..	...133235762	1.....2585	263	.....3.
Bangkok	....1222....	...3455642..	1...13235763	3.....2587	1.....266	33
Singapore	....12222...	...35666651.	1.1123235773	3.....2587	1.....266	33
New Delhi	...112221...	...3466661..	212112235774	63.....2588	51.....267	2.....35
Teheran	...1233331..	..155666762.	425211235886	863.....2589	74.....368	5.....35
Colombo	...123332...	...44666731.	221112235786	62.....2589	5.....368	2.....35
Bahrain	...1244331..	..155566762.	645211235887	963.....2589	84.....368	5.....35
Cyprus	...1334333..	...677888841	656655567898	986322234689	8731....1478	†4.....4†
Aden	...2345552..	1.1555678832	855211135799	973.....2589	851.....268	†2.....35
OCEANIA						
Suva (S)	.....	.....11111..	...24323463.	..1421..252.	...2.....2..	.....
Suva (L)	.....3.	21.331...173	124752112652	..252...252.	...2.....2..	.....
Wellington (S)	.....	....11121...	..1443234541	..242...2541	...2.....21.	.....
Wellington (L)	.....	11.11.....33	344641...264	.1352....441	..12.....21.	.....
Sydney (S)	.....1.....	...3453221..	..1553235651	...22...2573	241	.....
Sydney (L)	.....	....2.....13	2223521...75	..133...1363	...1.....23.	.....
Perth	...1232.....	...57662....	311253234551	31..2...2586	1.....365	32
Honolulu	.....	.....111.	...12211452.	..2321..22..	..12.....	.....
AFRICA						
Seychelles	...2334432..	1.1555677742	854111235799	962.....2589	84.....268	†.....35
Mauritius	...2356554..	1.1556778853	855211225799	973.....2589	84.....268	†2.....35
Nairobi	...13456651.	2..555678963	976311125799	995.....2589	872.....268	†4.....35
Salisbury	...14567761.	31.566678974	986511125799	9962....2589	884.....268	††.....35
Capetown	....457775..	1..576778954	85.732225799	99541...2589	8851.....268	5†2.....35
Lagos	....3477773.	32.376668984	996731115799	99851...2589	7862.....268	4†3.....35
Ascension Is	....3445662.	22..76557983	995452112699	99852....489	8862.....157	5†3.....25
Dakar	....2456673.	11.176666883	886652112689	99852....379	8862.....57	5†3.....25
Las Palmas	....1233342.	...167788872	765776666799	998653333589	997421..1268	††4.....3†
S AMERICA						
South Shetland	.....56652.	2678873	632123225678	88742...2457	7862.....125	4†3.....2
Falkland Is	.....56663.	11...4678883	886633224578	99852...1247	8862.....15	5†3.....2
Rio de Janeiro	.....344453.	11..17656783	886643211379	99852....159	8862.....27	†53.....4
Buenos Aires	.....245553.	11...6676783	886533221368	99852.....37	8862.....15	††3.....2
Lima	.....22232.	....1.565563	754352221136	89753.....4	6862.....1	3†3.....
Bogota	.....11222.	2554553	643243211126	897531.....4	6862.....1	3†3.....
N AMERICA						
Barbados	.....122232.	5555573	753343211147	997531....16	8862.....3	5†3.....
Jamaica	.....11121.	1444452	632123221126	787421.....3	5862.....1	2†3.....
Bermuda	.....1111.	2444563	631123221247	886421....15	6862.....2	3†3.....
New York	.....1.	233442	521.13221246	775321....14	5862.....1	253.....
Mexico	.....11.	133331	421.11221113	475321.....	1662.....	.33.....
Montreal	.....	223342	42..13222246	775321....14	4762.....1	253.....
Denver	.....	1121	31....122123	35431.....1	1462.....	.23.....
Los Angeles	.....	.....112.	21.....24212	24431...1...	.362.....	..3.....
Vancouver	.....	.....	1.....12222	23331...2...	.252.....	..2.....
Fairbanks	.....	.....	...121113221	112421..2211	..22.....	.....

The provisional mean sunspot numbers for January and February 1983 issued by the Sunspot Index Data Centre, Brussels, were 85·8 and 50·1 respectively. The maximum daily numbers were 126 on 8 January and 94 on both 1 and 4 February, and the minimums were 55 on 3 January and 10 on 14 February. The predicted smoothed sunspot numbers for April, May, June, July and August are: respectively: (classical method) 89, 87, 85, 83 and 81; (SIDC adjusted values) 90, 88, 86, 84 and 82.

MICROWAVES

Charles Suckling, G3WDG*

A transition from N connectors to RT-Duroid D-5880

Last month a simple preamplifier for 3·4GHz was described. It was mentioned that N-connectors might be usable instead of the rather less commonly available SMA types specified. This has indeed proved to be the case, and the writer has successfully constructed a preamplifier using N-sockets.

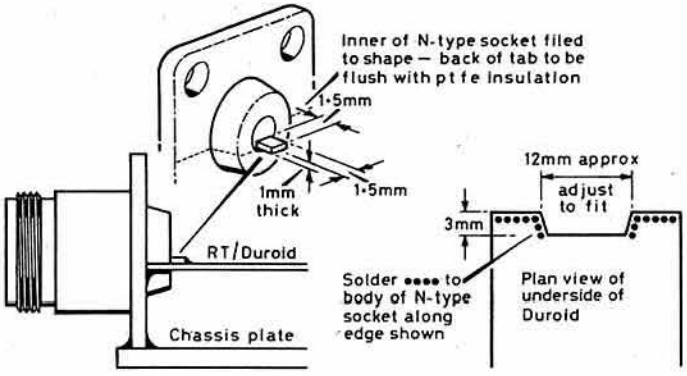


Fig 1. Details of N socket to RT-Duroid transition

The inner of the N-socket is filed down to form a small tab, as shown in Fig 1. This tab is soldered to the 50Ω microstrip lines on the pcb. In order to minimize the discontinuity on the junction of the pcb and the microstrip, a cut-out is made in the pcb to accommodate the bush on the connector. In order to allow for this, the length of the pcb has to be increased by 6mm. The rear side metallization on the pcb is soldered to the body of the N-socket, as shown in the figure.

Operating news

Jim Mors, G6HKA, reports that he and Mike Parkin, G8NDJ, had a successful contact on 10GHz between sites in the Derbyshire hills on 15 February. His equipment was a Gunn diode intruder alarm shifted down into the amateur band, with 100MHz i.f. G8NDJ was using a 10mW Gunn transmitter, and a directional-coupler-based receiver using a GEM1 diode in the mixer. Further tests are planned, and no doubt Jim and Mike will be active in the area during the forthcoming cumulative contest.

Several reports have been received concerning the excellent lift which occurred on 23 January. Richard Hope, GW8TVX, sent an extract from his log which showed his contacts with the following stations on 1·3GHz: F1FHI (ZH63d), F1BUU (ZE08e), G3GNR (XK20g), F6DZK (AI20d) and F2KX (BJ71h). All these contacts were made with just 1W at GW8TVX, from his masthead-mounted MM transverter, feeding an array of four 23-el F9FT Yagis.

From Northumberland, Gordon Emmerson, G8PNN, also reported excellent results on 1·3GHz with 1W output power, in the same lift. He worked two new counties, Greater London (G3GIM) and Essex (G4KDH), as well as G3LTF and G8GP. Later, two new countries were also worked —Switzerland (HB9AMH/P and HB9MIN/P) and Austria (OE2CAL). These contacts were also in new squares (DH and GH respectively). The contact with OE2CAL was also Gordon's best dx to date on 1·3GHz—1,313km. In addition, three further new squares were worked—AL (G4KDH), DK (DJ5BV) and FM (DK6AS) bringing G8PNN's total to 30. Soon Gordon hopes to upgrade his antenna system from one 28-el loop-Yagi to two, and to increase power. No doubt he is going to be in much demand for Northumberland and ZP square!

Another lift occurred in February. From the Midlands 1·3GHz was open into DK and DL squares, and a number of very strong signals were heard. Steve Berry, G4LRT, (ZM45d) worked DL9LU and DD3KL (both in DK13j) on 19 February, with signals in the region of 30–40dB above noise. Tests with these stations were also carried out on 3·4GHz, with considerable success. DL9LU's signal (6W of ssb into a 19dB horn) was received at 10–15dB above noise; DD3KL using similar equipment but 20m lower and with an obstructed take-off, was just detectable. The path length to both stations was 550km. Unfortunately G4LRT's 0·5W output power was insufficient to be heard by either of the German stations. The G4LRT 3·4GHz set-up consists of an interdigital converter on receive. On transmit, 1mW at 92MHz is extracted from the converter's local oscillator, which is then multiplied to 368MHz (0·5W) by a Mutek microwave drive source. After amplification to 10W by a retuned Wood & Douglas 70FM10, the signal is multiplied first to 1,104MHz (5W) by a retuned MMV1296 tripler and then to 3,312MHz (2W) by a homebuilt BXY28 tripler. This signal is mixed with 144MHz ssb drive to give approximately 0·5W p.e.p. on 3,456MHz. The antenna is a 1·2m dish with a beer-can feed.

On the east coast, Dave Robinson, G4FRE, reported hearing the Edinburgh beacon GB3EDN (1,296·990MHz—YP04g), using a fixed 15/15 Yagi beaming *east*! The signal was approximately 5dB above noise, and this is probably the first time the GB3EDN beacon has been heard so far south. He also notes that Belgium is now active on 2·3GHz, being represented by ON5GF. He recently worked G8HPU and G3LQR, and apparently has good equipment (20–30W output).

Arie Dogterom, PA0EZ, has kindly sent further details of PA2DOL's record-breaking 500km + contact on 5·7GHz, made on 30 October 1982. The other stations involved were DK0NA/DB6NTA in FK square. PA2DOL was running 6W output from a twt. Arie also notes that the reason why Dutch amateurs do not use 144MHz for microwave talkback is simple—none of them is active on the band! Apparently 144MHz is too crowded in Holland to be useful for talkback purposes, so 432MHz was adopted.

RF and microwave radiation hazards

Readers may be interested to know that the current safety standards for exposure to rf and microwave radiation are at present under review in the UK. The National Radiological Protection Board has recently produced a document entitled "Proposals for the Health Protection of Workers and Members of the Public against the Dangers of Extra Low Frequency, Radiofrequency and Microwave Radiations: A Consultative Document". This is available from HMSO, at £2.

As far as the bands above 1GHz are concerned, the proposed limits for the continuous exposure of the general population, including children, are 43·2W/m² (4·32mW/cm²) at 1,296MHz, and 50W/m² (5mW/cm²) for all the other microwave bands. The currently recommended maximum limit is 10mW/cm².

Beacon news

News has been received of two new beacons, GB3GBY and GB3CEM, which have become operational recently on 10GHz. GB3GBY is located on a block of flats in the centre of Grimsby, and runs 10mW rf output from a Gunn oscillator on 10·4GHz. At the moment a temporary antenna is in use (pointing south) but this is to be replaced in the future by an omnidirectional 16-element slotted-waveguide antenna. Reception reports would be welcomed by G3RXP.

GB3CEM is located in Sutton Coldfield at the home QTH of its keeper, G3AYJ (QTH loc ZM31c, ngr SP102 944). The antenna is omnidirectional and consists of a 16-element slotted reduced-height waveguide. It is mounted 9m agl, and the site is 137m asl. The beacon frequency is 10,368·880MHz, and identification is by F1A keying (850Hz shift). The transmitter consists of a Microwave Committee oscillator board driving a Mullard BGY22C module (2.5W output), followed by a snap varactor multiplier and a three-section waveguide cavity filter. Power output is 3mW. It is hoped to move the beacon to a better site in the future, but in the meantime reception reports would be welcomed by G3AYJ.

Awards

There are several exceptional claims to report this month. During a clear-out prior to going to Canada, PA0KKZ discovered a QSL from G8FJG/P for a contact on 10GHz in August 1975! His claim for "first beyond 150km on 10GHz", although inevitably dated 1983 and No 62, would have been about No 22 in 1975. Another claim was from John Hailes, G8ADC, near Dunstable, for five squares worked on 2·3GHz, for which he has certificate No 5.

On 1·3GHz the first claim of 1983 came from G8TXG who went straight for "ten squares sticker" on his initial Microwave Certificate, No 17. From York came five exotic QSLs from G4KCT to bring Barry Firth the 30 squares sticker, only the fourth to be won for 1·3GHz. A topping-up claim

(Continued on page 343)

*46 Windsor Close, Towcester, Northants

10GHz activity during the 1982 cumulative contests

by C. W. SUCKLING, G3WDG, and P. SUCKLING, G4KGC*

THE PURPOSE OF THIS ARTICLE is to describe the activity on 10GHz during the 1982 cumulative contests in somewhat more depth than is possible in the normal contest report (see *Rad Com* December 1982).

The 1982 contest was held over six weekends last summer, and attracted 25 entrants. An analysis of their logs showed that 157 paths were worked, involving 66 different sites. The distribution of this activity is shown in Fig 1. A full list of the paths worked is given in Table 1. The sites are referred to numerically, and exact details of these are given in Table 2. In the absence of an ngr a callsign has been given, so that anyone wishing to find out more details of a particular site or path will know where to enquire.

The most distant contact (339km) was a crossband between GW3YGF/P and F8WN/P (4-25). The equipment used supplied 10W of wideband fm to a 4ft dish at GW3YGF/P, and a 2ft dish feeding a 6dB noise-figure receiver employing a gallium arsenide fet preamplifier at F8WN/P. Conditions were reported to be above average. The longest two-way contact (194km) was between G3JHM/P and F6DCK/P, F8WN/P (25-8), and is an excellent example of what can be done with low-power wideband fm equipment under good conditions.

The use of narrowband equipment, with its greater potential for working obstructed paths, undoubtedly helped a number of stations to work paths previously considered "impossible" on wideband. One such path, worked for the first time this year, was Mynydd Maen to Merryton Low (4-13). This shows what can be worked fairly easily using simple narrowband equipment —in this case 1mW to 2ft dishes. A plot of this path is shown in Fig 2—with Titterstone Clee, the obstruction, being some 700ft above the line-of-sight path.

Approximately half the stations operational during the contest were equipped for wideband fm only, using Gunn oscillators to generate the rf. The highest-powered oscillator used 40mW, with the majority in the 5-15mW region. Diode mixers were universal. The remaining stations, with one or two exceptions, were equipped for both wide and narrowband. In almost all cases the G3JVL mixer system was employed as the transmitter/receiver for narrowband, although one or two stations used direct frequency multiplication to obtain more output power. Gallium arsenide fet preamplifiers and twt power amplifiers were used by four stations. Dish sizes varied from 18in to 4ft, with about 2ft being the average.

The wide spectrum of equipment capabilities was matched by the variety of propagation modes used. The wideband fm equipment was more or less restricted to line-of-sight paths under normal conditions, but during enhanced conditions (eg super-refraction) dx contacts were possible; indeed most of the cross-Channel contacts were made with this type of equipment. As mentioned

*46 Windsor Close, Towcester, Northants.

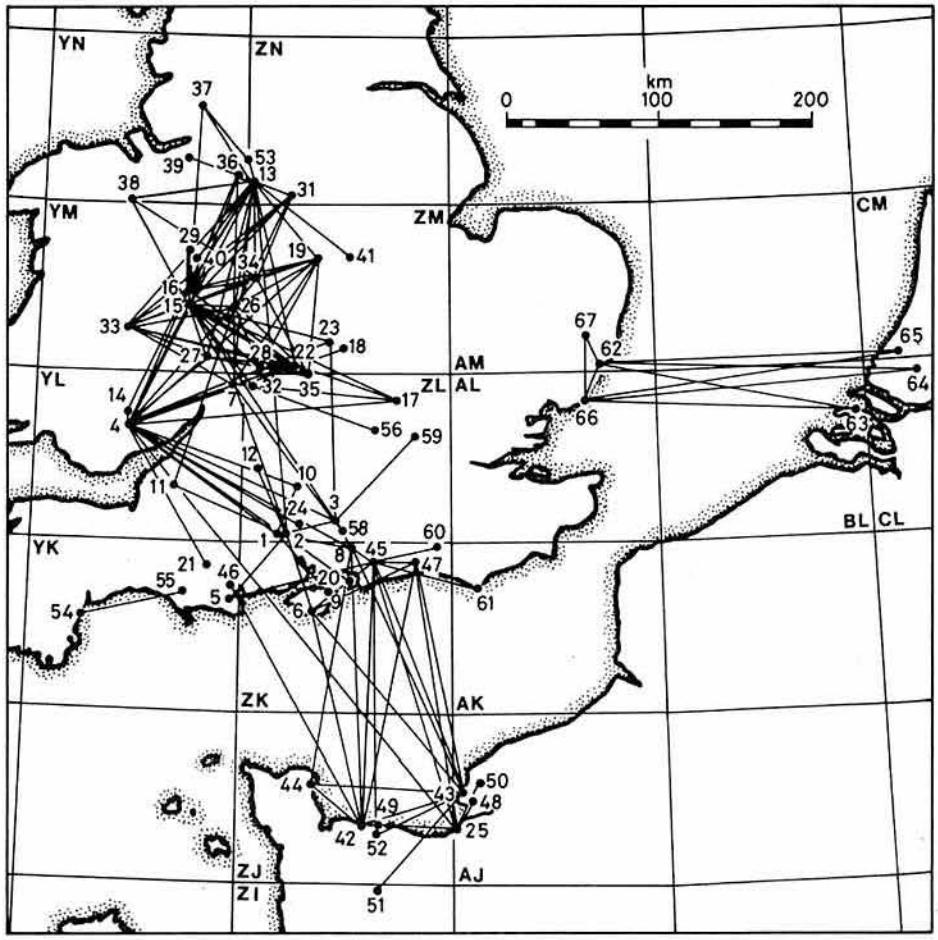


Fig 1. Paths covered during the 1982 10GHz Cumulative Contest

Table 1. List of paths on map

1 — 3	1 — 4	1 — 8	1 — 9	1 — 10	2 — 5	2 — 6
2 — 7	2 — 11	2 — 12	2 — 13	2 — 3	3 — 58	3 — 59
3 — 8	3 — 23	4 — 14	4 — 7	4 — 15	4 — 16	4 — 13
4 — 3	4 — 17	4 — 18	4 — 19	4 — 20	4 — 10	4 — 21
4 — 22	4 — 23	4 — 8	4 — 24	4 — 25	4 — 26	4 — 27
4 — 28	7 — 56	7 — 3	7 — 17	7 — 19	13 — 34	13 — 33
13 — 38	13 — 39	13 — 31	13 — 19	13 — 40	13 — 27	13 — 26
13 — 22	13 — 7	13 — 41	13 — 37	13 — 36	15 — 26	15 — 19
15 — 28	15 — 13	15 — 16	15 — 22	15 — 29	15 — 36	15 — 31
15 — 7	15 — 3	15 — 32	15 — 17	15 — 23	15 — 33	15 — 34
15 — 27	15 — 35	16 — 31	16 — 19	16 — 13	16 — 36	16 — 37
16 — 22	16 — 29	16 — 34	16 — 33	16 — 14	22 — 27	22 — 15
22 — 17	25 — 48	25 — 47	25 — 45	25 — 49	25 — 50	26 — 19
26 — 28	26 — 31	26 — 36	26 — 11	26 — 35	26 — 7	26 — 34
28 — 22	28 — 19	33 — 34	33 — 7	33 — 26	33 — 31	33 — 27
33 — 35	33 — 22	34 — 19	34 — 31	35 — 34	35 — 19	35 — 27
38 — 15	38 — 34	42 — 43	42 — 44	42 — 8	42 — 45	42 — 46
42 — 6	42 — 47	43 — 51	43 — 8	43 — 52	43 — 45	43 — 6
43 — 47	44 — 43	44 — 8	45 — 8	45 — 60	45 — 6	45 — 5
45 — 47	45 — 52	45 — 61	47 — 6	53 — 37	53 — 13	54 — 55
62 — 63	62 — 64	62 — 65	62 — 66	62 — 67	66 — 67	66 — 63
66 — 64	66 — 65					

Paths worked which are not on map are:

7 — 68	15 — 68	16 — 28	16 — 26	16 — 7	16 — 32	16 — 35
26 — 22	25 — 8					

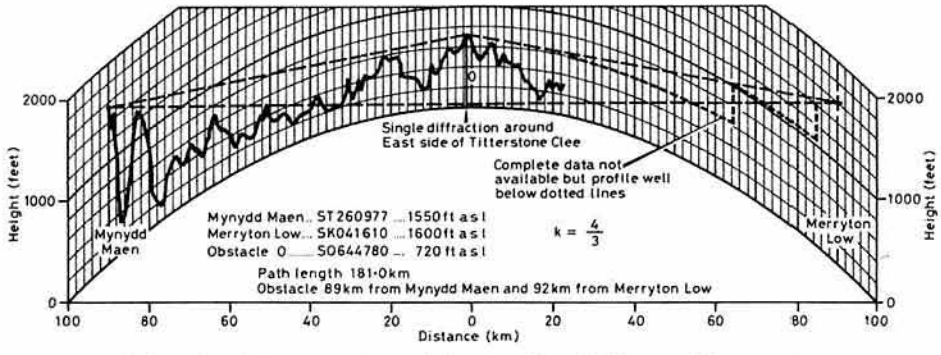


Fig 2. A plot of the non-optical path between Mynydd Maen and Merryton Low

Table 2. List of sites used in the 1982 10GHz Cumulative Contests

QTH No	QTH Loc	NGR	QTH
1	ZL72c	SU275 259	14km E Salisbury
2	ZL73g	SU230 257	9km E Salisbury
3	ZL65e	SU634 388	G4MBS, QTHR
4	YL25j	ST260 977	Mynydd Maen
5	YK30e	G8MCQ/P	8km SW Wareham
6	ZK34a	SZ494 773	St Catherines
7	YL10c	SO997 246	Cleeve Common
8	ZK06h	SU717 204	Butser Hill
9	ZK25h	G3KSU, QTHR	Ryde
10	ZL53b	SU373 616	Walbury Hill
11	YL58f	ST485 572	18km SSW Bristol
12	ZL41c	G3KEU/P	14km SSW Swindon
13	ZN61f	SK041 610	Merryton Low
14	YL15e	GW3KEU/P	5km SW Abergavenny
15	YM48f	SO601 771	Titterstone Clee
16	YM48h	SO594 867	Brown Clee
17	ZL18h	TL007 195	2km SW Dunstable
18	ZM65d	SP690 490	G3WDG/G4KGC, QTHR
19	ZM24j	SK485 103	Markfield
20	ZK16f	SZ710 992	G3JVL, QTHR
21	YK19a	G8MCQ/P	11km W Blandford
22	ZM73j	SP356 422	10km NW Banbury
23	ZM65g	SP583 476	11km N Brackley
24	ZL73c	G8KRD/P	Farley Mount
25	AJ51h	F8WN/P	18km S Le Havre
26	YM50e	SO943 798	9km N Bromsgrove
27	YM79h	SO768 454	2km SSW Malvern
28	ZM71d	SP115 364	Fish Hill
29	YM28h	G3MWQ/P	2km S Wellington
30	Duplicate site		
31	ZN73g	SK306 516	8km S Matlock
32	ZL01j	SP050 280	16km S Evesham
33	YM55f	SO196 645	14km ENE Llandrindod Wells
34	ZM31j	SP061 974	Barr Beacon
35	ZM73d	SP395 523	12km N Banbury
36	YN70j	SJ934 675	6km SSE Macclesfield
37	YN38a	SD648 126	Winter Hill
38	YN75f	SJ209 481	Cyrn-y-Brain
39	YN57d	SJ522 753	Harrol Edge
40	YM28j	G3MWQ/P	The Wrekin
41	ZM26g	SK767 058	10km W Oakham
42	ZJ56b	F8WN/P	5km W Port-en-Bessin
43	AJ31j	F6DCK/P	Octeville
44	ZJ34a	F8WN/P	La Pernelle
45	ZK07f	SU878 111	6km N Chichester
46	YK30a	G8MCQ/P	7km S Wareham
47	ZK09f	TQ134 120	Chanctonbury Hill
48	AJ31d	F1BQ QTHR	Le Havre
49	ZJ57a	F1BHL/P	—
50	AJ32h	F6DCK/P	Epouville
51	ZI07A	F1BHL/P	Aunay sur Odon
52	ZJ57j	F1BHL/P	Port-en-Bessin
53	YN60d	SJ968 727	5km ESE Macclesfield
54	YK33j	SX919 751	3km NW Teignmouth
55	YK28g	SY608 876	8km SW Dorchester
56	ZL27g	G8EUQ/P	3km SE Princes Risborough
57	Duplicate site		
58	ZL75b	G3JHM/P	4km SW Petersfield
59	ZL29f	G3BNL/P	Old Reading
60	ZK10a	TV332 133	10km N Brighton
61	AK22h	G4NBC/P	Beachy Head
62	AM78f	TM351 391	Bawdsey
63	BL30a	PE1BLE/A	—
64	CL03j	PA2DOL	—
65	CM72d	PA0DBQ	—
66	AL17a	TM265 235	Walton-on-the-Naze
67	AM67b	TM316 637	G3LQR, QTHR
68	YL15c	GW8SHF/P	4km SW Abergavenny

above, a number of non-line-of-sight paths were worked regularly under normal conditions, using narrowband. For these contacts the main propagation mode was knife-edge diffraction for the singly, or possibly doubly, obstructed paths, with troposcatter taking over for the more difficult paths. Certainly as far as the stations using higher power were concerned this latter mode of propagation was extremely reliable, and often yielded stronger signals on 10GHz than on the 144MHz talkback! A good example of this was path 2–13 (236km), over which 10GHz signals were 57 on ssb, while on 144MHz cw had to be employed. The relatively good weather experienced during the contest periods meant that rainscatter propagation was observed on only a few occasions this year. Probably most stations appreciated the dry weather more!

Although most of the activity was portable, some success was achieved from home stations (3, 9, 18, 20, 48 and 67). In particular, G4MBS demonstrated what can be done on 10GHz from a fair fixed site given state-of-the-art equipment. Virtually all the dx contacts made from the fixed stations this year involved high power, preamplifiers and troposcatter. This is not to say that home station activity using much simpler equipment could not have been successful—rainscatter in particular can offer relatively low-loss propagation over highly-obstructed paths.

Talkback continued to be a problem in 1982. The use of 144MHz is becoming increasingly less effective due to the very high occupancy of this band. QRM is a serious problem, especially from portable sites. The microwave calling frequency of 144·330MHz was unusable in many areas, and it is proposed that 144·175MHz be adopted for the next contest. On the east coast, 432·350MHz was used for talkback during the tests across the North Sea, as 144MHz is even more over-crowded on the Continent than it is in the UK. The rather undesirable situation of needing two bands for talkback is developing, but unfortunately there seems to be no easy solution. One clear message learnt from the 1982 event was that if you intend to take out narrowband equipment, then the talkback equipment has to be first class if the potential of the 10GHz equipment is to be fully realized.

In conclusion, it can be seen that the 10GHz Cumulative Contest is very well supported, and indeed forms the focus for much of the UK activity on this band, as well as helping to stimulate international contacts. In fact at a forthcoming IARU meeting the RSGB will be suggesting that other amateur radio societies in Region 1 adopt this contest; it is hoped that this will encourage activity on the Continent and increase international contacts. On the home front, there are large areas of the UK where activity is very low or non-existent. It would be nice to see a more uniform distribution next year!

The authors would like to thank S. Davies, G4KNZ, for the information contained in Fig 2. □

MICROWAVES

(Continued from page 341)

from Steve Berry, G4LRT, would make any 144MHz operator envious, let alone a 2·3GHz one: Sweden and Germany worked last year brought him close to his 2·3GHz ten squares sticker, and contact with G3AUS in Devon, over a path of some 150 miles, brought him his tenth card for 2·3GHz.

The panel below shows current performance on the 2·3GHz band. To date there have been no claims for operations on 3·4 or 5·7GHz.

Bryan Harber, G8DKK, of Luton, held his fire until he had enough cards to go straight to the 1·3GHz 25 squares category, and also qualified for the rare distinction of a 1·3GHz Senior. He is the first Class B operator to do so. His "Four Metres and Down" parchment is No 6, preceded only by G4BEL (1976), G3DAH (1979), G8GP and G3TDG in 1980, and G3OSS in 1981. A third certificate which went to G8DKK was for his "first beyond the 600km mark on 1·3" confirming a contact made with EH square back in 1980: the parchment was numbered 51. And all this was achieved with largely home-built equipment, a fact which at Bryan's request has been inserted on the certificates. Two homemade loop Yagis are "upstairs", and an h/b gallium arsenide fet preamp and mixer are partnered by an h/b transmitter for 144MHz which is the prime mover for an eventual high-level 2C39A mixer plus 3CX100A5 power amplifier. The Senior 1·3GHz award took Bryan four years of card collecting: a policy of QSLing direct paid off in percentage returns, which represented a much higher rate than on 432MHz.

G4KCT and G3DY both hoisted their 1·3GHz scores to the 30 Squares level; and in other claims received on the same day G4BYV and G4LRT jumped to 40 Squares on 1·3GHz. G8LMW called on G5UM and watched while his "600km on 1·3" claim for working SM1BSA at 1,350km was checked and certificate No 5 issued, in company with No 19 in the 1·3/10 class, plus a "1·3 Standard" numbered 37.

Gradually all this activity on 1·3GHz is being complemented by more claims for "the next band up": to G4LRT went a sticker for 2·3/10 and to G4BYV a sticker for 2.3/20.

THE 2·3GHz PERFORMANCE TABLE

Squares Awards

2·3GHz/5: No 1 G4BYV 1980; No 2 G4LRT 1982; No 3 ON8QK/P 1982; No 4 DF4LY 1982; No 5 G8ADC 1983.
2·3GHz/10: No 1 G4BYV 1980; No 2 G4LRT 1983.
2·3GHz/15: No 1 G4BYV 1981.
2·3GHz/20: No 1 G4BYV 1983.

1983 Cumulative contests

A reminder that the 1983 Microwave Cumulative contest season begins this month (see "Contest News" for dates and rules). As last year there are two separate events (which run on the same dates)—one for 10GHz and one for the other bands. The rules are essentially unchanged, but please do read them before taking part! Following some criticism of the timing of last year's contest periods, this year there are at least four weeks between successive periods.

Late news

News has just been received about two forthcoming meetings. The first will be held at the usual Winchester venue on 17 April, and is scheduled to be a "workshop" meeting only; anyone who has equipment in need of testing or alignment is welcome to attend. Further details from G3JHM, QTHR. The second meeting is intended to be a normal round table event and will be held at Sheffield on 7 May, starting at 2.30pm. More details of this meeting can be obtained from G8AGN, tel Sheffield 304888.

G4CCH recently succeeded in making his first QSOs on 1·3GHz eme (with K2UYH and Z25JJ), using only an 8ft dish and a two-valve WB6IOM pa! More details next month. □

CONTEST NEWS

Region Round-up CW Contest rules

Transmitting section

1. The general rules for RSGB hf contests, published in the supplement to the January 1983 issue of *Radio Communication,* will apply.
2. **Eligible entrants.** All paid-up members of the RSGB resident in the British Isles (G, GD, GI, GJ, GM, GU and GW) holding a class A licence. Single-operator entries only.
3. **When.** 0700-1200gmt, Sunday 15 May 1983.
4. **Contacts.** CW only in the 7 and 3·5MHz bands. Entrants are requested to confine their 3·5MHz operation to the segment 3·510-3·590MHz. RST and serial number, starting from 001, must be exchanged, followed by R and the number indicating the operator's RSGB region—eg 599001 R08. (The composition of RSGB regions is given on page 54 of January 1983 *Radio Communication*).
5. **Sections.** a) Up to 150W input. b) QRP—up to 10W input.
6. **Scoring.** Three points for each contact with a station within the British Isles. Each station may be contacted for points only once on each band. The final score is the total points on each band, added together and then multiplied by the total number of RSGB regions worked on each band added together.
7. **Entries.** Separate log sheets must be used for each band. It would help the adjudicator if standard log sheets (form HFC1) were used. A cover sheet and signed declaration (form HFC2) must accompany the logs, which must be sent to: RSGB HF Contests Committee, c/o D. J. Lawley, G4BUO, 220 Shipbourne Road, Tonbridge, Kent TN10 3EL, and postmarked no later than Monday 30 May 1983.
8. Certificates of merit will be awarded to the leading three stations.

Receiving section

1. Transmitting section rules 1, 2, 3, 6 and 7 will apply, with the addition that holders of British class B licences may also enter.
2. A station may only appear once in the column headed "station heard". The callsigns of the stations being worked may only repeat once in every three contacts logged, except when the station is a new multiplier. Entrants should log the time; callsign of the station heard; RST, serial number and region given by that station; and the callsign of the station being worked.
3. **Awards.** Certificates of merit will be awarded to the leading three receiving stations.

VHF NFD 1983 rules

Stations wishing to take part in this year's VHF NFD should write to the chairman as detailed below to obtain a site registration form. The separate sections on 70MHz will continue this year, but with the cw section on the Saturday, and phone on the Sunday, with equal periods for each. The definition of antennas for the restricted section has been improved, and the requirement for different QTHs on all bands has been changed.

Figures in square brackets refer to the general rules for vhf/uhf contests published in the January 1983 issue of *Radio Communication.*

1. **Duration.** From 1400gmt 2 July to 1400gmt, 3 July 1983.
2. **Site notification.** Each group intending to compete must send details of the site to be used by completing a site registration form available on receipt of an sae from: VHF Contests Committee, c/o F. Mathews, G8ACJ, Easedale, Woodway, Merrow, Guildford, Surrey GU1 2TF. Completed forms must arrive at the above address not later than 3 June 1983. Entries will only be accepted from groups who have submitted a correctly completed form. Groups requiring confirmation that their registration has been received should enclose a stamped addressed post card.
3. **Bands.** Up to four separate stations can be used, operating on the 70, 144,432 and 1,296MHz bands. Only one station can score or give points on each band. Single-band entries on 144MHz will not be accepted. Stations operating on 70MHz must use cw only during the period 1400-2200gmt, and phone only during the period 0600-1400gmt, and should close down in the period 2200-0600gmt.
4. **Operators.** Any RSGB member or group of members operating from the British Isles (excluding Eire) may enter. Two groups operating from the same site may combine their scores subject to rules 3 and 5.
5. **Stations.** All the stations forming one entry must operate from within a circle of 1km radius centred on the operating position of any of the stations. Proof of permission to use a site may be required. All equipment, including antennas, must be installed on the site during the 24h preceding the contest, or during the contest. Only portable accommodation can be used to house the stations. The site may not be used for any transmitting activities by the group or member during the five days before this time. Stations may not use public mains supply. Power for all equipment must be derived from an on-site generator or battery.
6. **Scoring.** Contacts will be scored by the radial ring system [7a]. Scores from the two 70MHz sessions will be added to give the final 70MHz score.
7. **Contest exchanges.**
   (a) Contestants must exchange both callsigns, signal reports, serial numbers, QTH locator and QTH [12a].
   (b) On 70MHz, one scoring contact with a given station can be made in each session. Serial numbers start at 001 in each session.
   (c) On 144, 432 and 1,296MHz, only one scoring contact can be made with a given station [11a].
   (d) The 1·3GHz station may operate on any other band for the purposes of arranging a contact, but the exchange of contest information must take place on 1·3GHz only, and may not be interrupted by recourse to another band. CQ calls on another band should clearly be "for 1·3GHz only".
   (e) Serial numbers start at 001 and advance by one for each contact.
   (f) The QTH must be given in a different form in the two sections of the 70MHz event, and that given on 1·3GHz must differ from the form used on 144 and 432MHz.
   (g) No points will be lost if a non-competing station being contacted by an entrant is unable to supply a QTH, QTH locator or serial number, but the receiving operator must obtain enough information to be able to calculate the claimed distance score.
   (h) Contacts with stations whose callsigns appear on any of the group's cover sheets will not count for points.
8. **Sections.** There will be two sections:
   (R) Restricted section:
   (i) The power output on any band may not exceed 25W p.e.p.
   (ii) The height of any antenna may not exceed 35ft agl.
   (iii) Only one antenna per band may be used (eg no stacked, bayed, or colinear arrays). A slot-fed Yagi or quad antenna is permitted.
   (O) Open section: as per licence.
9. **Inspections.** All stations are subject to inspection by members of the VHF Contests Committee or nominated representatives. Should the inspector be unable to locate the site due to inadequate or incorrect information being given, the entry will be disallowed. In the event of a last minute change of site, it is the responsibility of the members of the group to make suitable arrangements for the inspector to find the new site. The inspector's brief will be to ensure that the rules and spirit of the contest are being observed.
10. **Entries.**
    (a) All entries must be postmarked not later than 25 July 1983.
    (b) Separate sets of log sheets and 427 cover sheets are required for each band.
    (c) A summary sheet 4422 must also be completed. Otherwise the scores on each band will be listed, but the total will not appear in the overall results table.
    (d) Entries must be addressed to; The Chairman, VHF Contests Committee, Easedale, Woodway, Merrow, Guildford, Surrey GU1 2TF.
11. **Other rules.** The following general rules will also apply: 5a, 8b, 9, 10a, 12a, 14-26.
12. **Awards.** The Surrey Trophy will be awarded to the overall winner in the Open section, the Arthur Watts Trophy to the overall winner of the Restricted section, and the Tartan Trophy to the leading Scottish entry. Certificates of merit will be awarded to winners and runners-up in all sections.

10GHz Cumulative Contest rules

0900-2000gmt, 24 April, 29 May, 26 June, 24 July, 21 August, 18 September

Three activity periods will count towards the final score. Entrants unable to be active for three periods are strongly encouraged to send in logs, as a record of their activity, but will not be eligible for an award. Such logs will be included in the table of results. All logs should be sent in, to assist in adjudication.

During each activity period, a station may change location once (see general rule 5b). For the purpose of this contest the "location" is defined as any point within 5km of a fixed point. Contestants may start from a new location for each activity period.

Entries from stations outside the UK will be accepted, whether or not they are RSGB members.

Stations operating from the UK must list on the cover sheet the national grid references of all sites used.

Crossband contacts will count for half-points (general rule 10b). A full contest exchange should be given on both bands, including location information, report and serial number.

Awards will be made to the winner; the runner-up; the leading non-crystal-controlled station using less than 100mW rf output; the leading fixed station (home QTH); the leading non-UK station, and the highest placed station who has not won an award before in this event. In addition, the leading station will receive the Alpha Award.

Except where modified above, the following general rules for vhf/uhf/shf contests, published in the January 1983 issue of *Radio Communication,* will apply: 1, 2, 3, 4a, 5b, 6a, 7b, 10b, 11b, 12a, 13-26.

All entries and checklogs to: VHF Contests Committee, c/o Dr C. W. Suckling,G3WDG, 46 Windsor Close, Towcester, Northants NN12 7JB.

Microwave Contest rules

0900-2000gmt, 24 April, 29 May, 26 June, 24 July, 21 August, 18 September

The following bands will be active on these dates: 2·3GHz—24 April; 3·4GHz—26 June and 18 September; 5·7GHz—29 May and 21 August; 24GHz—24 July.

Each band will be scored separately and each band leader will receive a certificate. In the case of 5·7 and 24GHz only the higher scoring day will count, although logs should be sent in for both activity periods if possible.

During each activity period, a station may change location once (see general rule 5b). For the purpose of this contest the location is defined as any point within 5km of a fixed point.

Entrants operating inside the UK must include the national grid references of all sites used on the cover sheets. A separate cover sheet is required for each band entered.

Crossband contacts will count for half-points (general rule 10b). A full contest exchange should be given on both bands, including location information, report and serial number.

Except where modified above, the following general rules for vhf/uhf/shf contests published in the January 1983 issue of *Radio Communication* will apply: 1, 2, 3, 4a, 5b, 6a, 7b, 8a, 9, 10b, 11a, 12a, 13-26.

All entries and checklogs to: VHF Contests Committee, c/o Dr C. W. Suckling, G3WDG, 46 Windsor Close, Towcester, Northants NN12 7JB.

21/28MHz Telephony Contest 1982 results—correction

The score of G4AFJ should have been 240,468, and his position in the UK Transmitting section should have been 10.

Cumulative Contests 1983 results

Most entrants seem to have liked the altered arrangements for this year's series of mini-contests. The 1·8 and 3·5MHz sessions were very popular, but 28MHz produced a very mixed reaction. Some operators were very enthusiastic about the addition of 28MHz sessions, while others were less keen. A number of inter-UK dx contacts were made on 28MHz, with distances of 150-300 miles being commonplace. Many of these were made with simple wire antennas, although some stations had the advantage of rotary beams. The best dx reported was a contact between London and Scotland, and several entrants achieved this.

As is customary in these contests, the results are tabulated by callsign in A to Z format. The committee was disappointed by the lack of support from listeners, but congratulations are in order for BRS44395 who submitted a first-class log. Almost every entrant commented about the contests and made suggestions for the future. These will be considered by the HF Contests Committee when making the arrangements for the next sets of cumulative contests. The following is a selection of these comments: "Most enjoyable—just long enough to work most of the stations heard"-*G3PGM*; "10m hopeless—much prefer 1·8 and 3·5"-*G4KRS*; "Regarding 28MHz, I am in favour of this being a regular feature as activity on the band is essential, or the cbers will take over"-*G3WP* (many other entrants also commented about illegal cb activity and the need to keep the band occupied-*G6LX*); "The sessions definitely sharpened up my speed and procedure and helped me to face the larger international contests with much more confidence. Thanks for organizing"-*G4OBK*; "I think two sessions on each band is enough and the decision to include 10m is excellent, even though it was pretty quiet here. Most of the 'novices' sounded quite proficient!"-*G2HLU*; "Suggest that 7MHz is included instead of 10m. Enjoyed the sessions very much, although would have preferred the original eight. 28MHz was doomed to failure from the start for a national contest. OK if you live in London or Birmingham, but for someone in the sticks it was a non-starter"-*G4GXI*; "Thought 28MHz was great fun and gave my local cbers a rough ride. I'd like to see the cumulatives kept on 28MHz if possible"-*G4BLX*; "Lift off on 10 never came, but not entirely without joy. It's certainly a disadvantage being in Cornwall"-*G4KKZ* (In spite of his comments, he made several good QSOs, the best being to Kent-*G6LX)*; "As for 28MHz, the least said the better"-*G3SWH*; "28MHz is a good idea, but GI is at a great disadvantage" -*GI4GYC* (Several contacts were reported between G and GI on 10m during the first session-*G6LX*); "Please could the times be changed to 0700-0900 and 1500-1700. There is not a lot of point in running a contest when many of the competitors cannot hear each other due to skip"-*GM4KGJ*; "Very enjoyable, why not include 7MHz as well as 28MHz next year?"-*G4FJW*; "I heard many weak stations on 28MHz, but none above S1 or 2. Not a good idea"-*BRS44395*; "I hope the 160m logs are useful. I didn't know about the contest or the rules but glad to join in"-*OZ1W*; "Thanks for a nice contest—just the job for us beginners—will certainly do it again"-*G4OQI*; "Some operators were sending too quickly and this tended to be off-putting for beginners"-*G4KOA* (and several others); "Hard going (on 10) but a very good idea. We must stimulate more activity on the band during the next few years"-*G3NKS* (operating G3SSO). *G6LX*

	1·8MHz	3·5MHz		28MHz			
Callsign	3 Jan	19 Jan	2 Jan	8 Jan	11 Jan	29 Jan	Club
G2HLU	-	-	49	47	19	12	-
G2WS	-	-	-	-	10	6	-
G3AWR	21	22	3	19	-	-	-
G3BDQ	CK	-	-	-	-	-	-
G3BFP	-	CK	-	-	-	-	SRCC
G3HQH	-	-	42	43	-	-	-
G3KDB	-	23	-	-	18	-	HFCC
G3MCK	-	-	39	30	-	-	Echelford
G3PGM	62	47	52	49	13	CK	-
G3SSO	-	-	56	-	23	-	GCRS*
G3SWH	57	35	33	-	4	6	-
G3WP	10	-	-	-	9	6	-
G3XWZ	57	40	-	-	-	-	-
G4ANH	-	17	-	-	-	-	-
G4ARI	44	40	52	57	17	15	-
G4BLX	-	-	49	30	-	-	East Barnet CG
G4BOU	52	42	54	47	13	5	Verulam
G4BUO	52	37	38	23	25	10	HFCC/Gravesend
G4ECI	35	CK	39	39	-	-	Stockport
G4EYD	32	37	39	30	11	17	-
G4FJW	30	-	50	49	15	-	-
G4GXI	26	31	22	31	-	-	Easington RS
G4HKC	21	-	24	26	-	-	Colchester
G4HVC	45	-	58	50	-	-	-
G4HZV	-	-	47	42	-	-	Farnborough DRS
G4JAI	27	34	-	-	-	-	-
G4JQL / G4JQL/A	-	40	33	-	16	-	-
G4KGG	49	38	-	-	-	12	L'boro/Falcon
G4KIE	-	-	13	16	7	6	-
G4KKZ	-	31	-	-	5	5	-
G4KOA	-	-	15	-	-	-	-
G4KRG	-	-	-	34	-	-	Stockport
G4KRS	29	37	46	47	CK	-	-
G4NHS	-	-	23	25	-	-	-
G4OBK	50	15	38	40	-	-	Leyland Hundred
G4OHL	-	-	19	22	6	4	-
G4OKN	-	-	24	30	12	7	-
G4OOS	21	23	39	-	-	-	-
G4OQI	-	-	12	15	-	-	-
G6LX	54	58	61	42	32	18	HFCC/SRCC
GI4GYE	-	-	6	15	-	-	-
GM4KGJ	44	33	18	-	-	-	RNARS
GW3EOP	31	39	27	32	4	-	Port Talbot
GW3SB	-	-	29	30	-	-	-
OZ1W	44(CK)	36(CK)	-	-	-	-	-

LISTENER SECTION

	1·8MHz		3·5MHz		28MHz		
Station	3 Jan	19 Jan	2 Jan	8 Jan	11 Jan	29 Jan	Club
BRS44395	-	40	44	47	5	-	-

CK = Check log
*Operated by G3NKS

21MHz CW Contest 1983 results

Participation in the contest this year was slightly down over previous years and as stated in the rules the committee has gone back to listing the sections showing competitors in the participating continents.

The standard of log keeping was high, but a number of people still did not include a separate list of countries worked.

Very many thanks for all the comments and anecdotes which ease the checking process. It should be recorded that the overall impression was that the rules should remain as they are for next year's event. *G3HCT*

Check logs: UA3TAM, G2AJB, BRS 30694, SM0IX, UA9YBR, G2DHV, OH6MW, OK1US, UB5LAE, GM4ELV, YU4NF, UL7GAA, UA4YAZ, UA1WEA, UV3DN, K6VL, SP1151-PO, G3DQL, YZ3CM, YZ3LM, OH1HC, HE9EVI, YZ-9540/A, ONL383, OK1-19973, and UC2-009-658.
Multi-op entries: UK8AAI and JA9YBA.

BRITISH ISLES

Posn	Callsign	Points	Posn	Callsign	Points
1	GD4BEG	117,414	26	G5PQ	29,889
2	G4CNY	113,967	27	G3JFF	29,025
3	G4GIR	100,101	28	GW3MPB	28,380
4	G3RVM	97,284	29	G3KSH	26,400
5	G3NOM	93,000	30	G3SDC	26,280
6	G4BUO	86,676	31	G4KRS	23,874
7	G4DSE	85,224	32	G4NDL	23,085
8	G3PSM	83,655	33	GM3ZRT	22,932
9	G3HVX	81,648	34	G4KGK	22,575
10	G4MBC	81,420	35	GW3ZDW	20,382
11	G3UFY	77,760	36	G3XQX	20,034
12	GM3OXC	75,420	37	G3JRM	19,866
13	G3PVA	71,307	38	G3IMK	19,845
14	G4AMT	65,151	39	G3SXW	19,200
15	G3TXF	62,481	40	G3ESF	18,798
16	GM3RAO	61,350	41	GM4FNA	17,982
17	G3FKH	60,312	42	GM4KGS	16,317
18	G4IUF	48,450	43	G4IQM	13,824
19	G3SYA	45,552	44	G4MPK	11,766
20	G5MY	44,688	45	G3AWR	10,800
21	GM4EJI	44,550	46	G2HDR / G4BXN	3,024
22	G4BLX	43,632			
23	G2QT	37,152	48	G3WP	2,457
24	G4IDC	32,154	49	G8DI	2,109
25	G3JJG	31,302			

EUROPE

Posn	Callsign	Points	Posn	Callsign	Points
1	UA3EAL	7,722	29	UA6AJO	2,049
2	UW3UO	7,182	30	OK3KAP	2,013
3	OH1FM	7,068	31	OK1DGN	1,950
4	UP2BIM	7,020	32	OH6RC	1,914
5	UA3DLN	6,579	33	LA1VL	1,770
6	UP2BEI	6,426	34	OH8TU	1,650
7	OK2KYC	5,715	35	OH9PF	1,485
8	OK2BSG	5,400	36	OK1KZ	1,377
9	OK1AGN	4,995	37	OE5KML	1,290
10	UA3PBT	4,326	38	OH6GZ	1,272
11	YU7NGO	4,212	39	HA4XX	1,104
12	LZ1FI	4,158	40	HA3HZ	1,053
13	LA9XG	3,861	41	LA1IE	1,020
14	I0SGG	3,840	42	LZ1IF	1,008
15	OH5UO	3,666	43	DL9LAI	840
16	SM0TW	3,234	44	SM0MLL	816
17	OK1DAV	3,159	45	OH1HS	648
18	UA3XAW	3,120	46	SM6LAZ	612
19	YU3JS	3,081	47	UP2PBM	558
20	SM0KV	2,970	48	OK1TW	540
21	OH7NW	2,745	49	DL1JC	414
22	UO5SA / YU7SF	2,700	50	OK1DVK	378
			51	Y21TL/P	342
24	OH7XI	2,520	52	OK3ZWX	336
25	HA7MY	2,448	53	SM5CSS	294
26	OK3CMF	2,178	54	OK1DZD	150
27	UA4AHA	2,160	55	OH5RZ	72
28	YU3HAM	2,052	56	LA4DCA	42

ASIA

Posn	Callsign	Points	Posn	Callsign	Points
1	UJ8JAS	6,576	12	JH1KLN	693
2	UA9CJA	4,545	13	JA6GGD	558
3	9K2BE	3,315	14	JA6LDD	372
4	JA1HGY	2,376	15	JA7YFB	270
5	UF6QAC	2,052	16	JA2SAP/1	195
6	JR1UIO	1,485	17	JA3BLN	90
7	UA0SLN	1,296	18	JN1ENK	63
8	JH3WKE	1,128	19	JL1EJO	54
9	JA7JND	945	20	JR4ISK	42
10	JA7KM	720	21	JA1BNW	30
11	UM8MDX	696	22	JA6CNL	3

NORTH AMERICA

Posn	Callsign	Points	Posn	Callsign	Points
1	K1MA	6,000	11	K5MM / WD0CCW	1,296
2	K2PZ	5,088			
3	KA1CY	4,746	13	K1BV	1,248
4	N4XM	4,500	14	W9OA	1,029
5	VE1CEG	4,134	15	KS0T	891
6	K5BDX	2,772	16	VE4MF	735
7	W2ZZ	2,520	17	K1UCA	300
8	N6RA	2,457	18	VE3HOU	168
9	VO1AW / VE2DPO	1,512	19	KD4PP	63
			20	KH6IJ	36

BRITISH ISLES QRP

Posn	Callsign	Points	Posn	Callsign	Points
1	G4ELZ/P	20,916	4	G3VMY	8,217
2	G4BUE	11,988	5	G3IQF	1,372
3	G3LHJ	9,951			

REST OF WORLD QRP

Posn	Callsign	Points	Posn	Callsign	Points
1	SM0FSM	3,654	7	EA2CR	1,089
2	UA9AFG	2,700	8	OK3KEG	930
3	SM0NBC	1,890	9	OK2PAW	612
4	OH5TF	1,620	10	SM6AWA	450
5	OK3TBN	1,200	11	JA6VZB	270
6	OH3NJ/1	1,104	12	HA4YG	225

Second 1·8MHz Contest 1982 results

This contest enjoyed good conditions and a noticeable increase in activity, despite the complete absence of Russian stations, presumably due to the death of President Brezhnev. In total 180 UK and 117 overseas calls were logged, with 56 counties and 17 countries represented. Among those countries many were pleased to work ZB2EO, FC9VN and LX1YZ. The QSO rate was still brisk at the end, and one can only speculate on the possible scores had the UAs been active.

In the event Ron Stone, GW3YDX, repeated his success in the summer contest to

lead the UK section with 799 points from 172 QSOs, including 57 bonuses. In second place by just six points, reflecting the position on claimed scores, was Ken Riddoch, GM3ZSP, whose score of 793 contained 56 bonuses. Both operators claimed in excess of 800 points. Last year's winner Walt Davidson, GW3NYY, had to be content with third place this time with 782 points, but topped the bonus count with 59. The supply of first timers has by no means dried up, with six new stations competing this time.

In the overseas section an immaculate log from August Unterwallney, DJ3XD, took first place with 436 points and 41 bonuses. In contrast many points were lost in the scramble for second place, filled eventually by Jean-Francois Courtot, F6BWO, with 384 points including 39 bonuses. Paul Levy, F9KP, the winner of the summer contest, gained third place with 374 points and 32 bonuses.

Most comments received were favourable, and entrants seemed pleased with the high level of activity, which if maintained might see QSO totals of 200 achieved, and perhaps justify restoring top band contests to 5h duration.

Checklogs from G3UOF and LA0BS are acknowledged with thanks. *G4BUO*

BRITISH ISLES SECTION

Posn	Callsign	QSOs	Points	Posn	Callsign	QSOs	Points
1	GW3YDX*	172	799	28	G4BOU	76	450
2	GM3ZSP*	171	793	29	G4DKG†	105	444
3	GW3NYY*	163	782	30	G3TIR	78	433
4	G4BUO	150	717	31	GM3OXC	73	424
5	G3PDL	152	705	32	G4ELZ/P	70	421
6	G3XTJ	140	689	33	G8RZ††*	75	399
7	G3SYM	140	684	34	G4KKZ	68	398
8	G4GIR	141	683	35	GM4KGJ	64	397
9	G3TXF	131	651	36	GW3JI††	70	394
10	G4NUT/A	148	634	37	G3BPM	66	389
11	G3OLB	126	632	38	G3KSH	62	385
	G3XWZ/A	141	632	39	G4HYU	80	379
13	G4BYG	119	591	40	G4ARI	60	365
14	GW4BRS	119	586	41	G3JJG	52	356
15	GM3WTA	126	585	42	G4ODR/P†	63	336
16	G4HMS	120	580	43	G2FNK	49	316
17	G3FKH	113	573	44	G4HVC†	50	314
18	G3VNC/A	107	568	45	G3BGM	51	303
19	G2MJ	105	567	46	G3ZJK	53	299
20	G4EXD/A	100	528	47	G3ZRZ	47	294
21	G3BDQ	118	524	48	G3GMM	43	228
22	G5EBU†*	98	518	49	G3AWR	34	222
23	G4BUW†	90	515	50	G4EBK	32	201
24	G3UFY	92	511	51	G3FVW	32	146
25	G3LHJ	92	498	52	G3HKO	19	135
26	G4AZN	85	474	53	G8QZ	19	117
27	GM3ZRT	94	461				

OVERSEAS SECTION

Posn	Callsign	QSOs	Points	Posn	Callsign	QSOs	Points
1	DJ3XD*	79	436	12	OL2BCC	34	209
2	F6BWO*	73	384	13	OK1DDU	31	205
3	F9KP*	75	374	14	OK2BWM	30	196
4	OZ1W*	75	346	15	OL4BET	30	192
5	LA4O*	74	330	16	OK1KZD	34	169
6	OK1DVK*	51	307	17	OK3CZM	20	136
7	FC9VN*	46	292	18	DL0TN	27	126
8	OL4BEV	39	268	19	PA2CHM*	8	67
9	OL4BDY	47	241	20	OK2SWD	1	8
10	OH3TQ*	36	234				
	ZB2EO†*	36	234				

* Award winners
† First-time award entrants
†† Senior citizens award entrants

Oxford DF Qualifying Event

Date: 24 April 1983.
Map: OS Sheet 164, 1:50,000 series, Oxford.
Assembly: 1300bst for start at 1320bst.
Location: College Farm, Pinchgate, Bletchington, ngr 522 173. Please approach from west.

Competitors requiring tea should notify Mr R. Pearce-Boby, College Farm, Pinchgate, Bletchington, Oxford, tel 0869 50767, not later than 17 April 1983.

Chelmsford/Colchester DF Qualifying Event

Date: 8 May 1983
Map: OS Sheet 168 1:50,000 series, Colchester and the Blackwater.
Assembly: 1300bst for start at 1320bst.
Location: Lay-by on north side of A604 at Stonebridge Hill, approx 1·5 miles east of Halstead, ngr 834 292.

Competitors requiring tea are asked to notify Mr R. Brocks, 30 Rowan Drive, Heybridge, Maldon, Essex, tel 0621 55707, home, 0245 353221, ext 723, work, not later than 1 May 1983.

Details of rules etc of RSGB top band df events may be obtained from E. L. Mollart, G6AGE, 17 Spinfield Mount, Marlow, Bucks SL7 2JU.

RSGB Region 1 VHF Contest results

There was no shortage of Region 1 contacts this year. G3ZLL of the PACT group made 87 Region 1 QSOs on 144MHz. For the internal Region 1 operators the auroral opening was either a blessing or a curse, with the Isle of Man group taking full advantage. The difficulty of asking for a return serial number from the Continentals was taken into consideration, and their QTH square was accepted as location. Several entrants were in doubt about this.

The Isle of Man Group will receive the G3SMM Shield, and G4BVE the G2CIP Shield as the PACT Section 2 winner. PACT 3 (G3ZLL) wins Section 3. Many thanks to all for coming on and also for your entries.

SECTION 1 MULTI-OPERATOR

Posn	Group	x Ht	70	MHz 144	432	Total	R1 QSOs	Best dx (km)
1	Isle of Man	1·4	153	7,929	—	8,082	3-40-0	1,735
2	PACT 1	1·8	1,365	2,143	737	4,245	8-53-19	1,123
3	Ainsdale	2·0	—	1,552	—	1,552	0-66-0	
4	Salford Uni	1·1	—	1,115	—	1,115	0-37-0	1,208

Contests calendar

April-September	10GHz & Microwave Cumulatives *(Rules in April issue)*
2 April	1,296MHz Trophy *(Rules in March issue)*
3 April	432MHz Trophy *(Rules in March issue)*
3 April	ROPOCO 1 *(Rules in March issue)*
9-10 April	BARTG Spring RTTY *(Rules in January issue)*
9-10 April	CARF Commonwealth Phone *(Rules in April MOTA)*
10 April	Stevenage & DARS 144MHz FM
17 April	144MHz CW *(Rules in March issue)*
17 April	Low Power *(Rules in February issue)*
24 April	Helvetia *(Rules in April MOTA)*
24 April	DF Qualifying Event Oxford *(Details in April issue)*
7-8 May	432/1,296/2,320MHz *(Rules in March issue)*
7-8 May	CQ M *(Rules in April MOTA)*
8 May	144MHz Low Power
8 May	DF Qualifying Event Chelmsford/Colchester *(Details in April issue)*
15 May	Region Round-up *(Rules in April issue)*
15 May	WAB LF Phone *(Rules in April issue)*
22 May	432MHz CW *(Rules in March issue)*
22 May	DF Qualifying Event Coventry
4-5 June	NFD *(Rules in February issue)*
12 June	70MHz/SWL
12 June	DF Qualifying Event Rugby
25-26 June	Summer 1·8MHz
26 June	VHF 144/432MHz Phone *(Rules in April issue)*
26 June	DF Qualifying Event Dartford Heath
2-3 July	VHF NFD *(Rules in April issue)*
10 July	DF Qualifying Event Salisbury
17 July	3·5MHz FD
31 July	432MHz Low Power
31 July	DF Qualifying Event Mid-Thames
14 August	70MHz Trophy & SWL
21 August	DF Qualifying Event Slade
28 August	ROPOCO 2
3-4 September	144MHz Trophy & SWL (IARU)
3-4 September	SSB Field Day
18 September	DF National Final South Manchester
October/ November	432MHz Cumulative
1-2 October	432-24GHz & SWL (IARU)
9 October	21-28MHz Phone
16 October	21MHz CW
16 October	1,296MHz Cumulative
5-6 November	144MHz CW
6 November	LF CW *(Rules in April issue)*
12-13 November	Second 1·8MHz
4 December	144MHz Fixed

SECTION 2 SINGLE-OPERATOR

Posn	Callsign	x Ht	70	MHz 144	432	Total	R1 QSOs	Best dx (km)
1	G4BVE/A	1·4	404	1,101	483	1,988	6-26-17	1,415
2	GD2HDZ	1·4	1,044	—	407	1,451	4-0-4	570
3	G3VNQ	1·4	915	214	95	1,224	5-15-5	499
4	G6DTD	2·0	—	1,106	—	1,106	0-40-0	640
5	G6AFH	2·0	—	578	204	782	0-28-10	—
6	G4HGT/P	1·0	—	720	—	720	0-38-0	(1,350 nc)
7	G6IAX	2·0	—	702	—	702	0-19-0	740
8	G6HXU	2·0	—	416	—	416	0-24-0	538
9	G8TZJ	2·0	—	188	—	188	0-12-0	124

SECTION 3 OUTSIDE R1

Posn	Callsign	x Ht	70	MHz 144	432	Total	R1 QSOs
1	G3ZLL	1·4	82	1,200	614	1,896	4-87-25
2	G6FUZ	1·6	—	931	—	931	0-67-0
3	G4LNV	1·8	369	123	—	492	5-4-0
4	G8NQP	2·0	—	400	—	400	0-12-0

Worked All Britain Contest rules

Lower Frequency Phone—15 May 1400-2100gmt
VHF 144/432MHz Phone—26 June 1400-2100gmt
Lower Frequency CW—6 November 1400-2100gmt.

Classes of entry: 1. Single- or multi-operator. 2. Single- or multi-band. 3. SWL. 4. Mobile.

Contest exchanges. Contest exchanges must consist of RS or RST report followed by a serial number starting at 001 and WAB area. Districts and book numbers may be requested but are not mandatory.

Frequency limitations. Contacts made outside these frequency limits will be declared void.

1. LF Phone Contest		2. LF CW Contest	
a) 7MHz	7,050-7,085kHz	a) 7Mhz	7,010-7,030kHz
b) 3·5MHz	3,730-3,795kHz	b) 3·5MHz	3,510-3,530kHz
c) 1·8MHz	1,900-1,980kHz	c) 1·8MHz	1,830-1,850kHz

3. VHF 144/432MHz Phone Contest
Contacts are not to be made on repeaters or any of the allocated calling frequencies.

Contest logs. All entries should be in the same format as the WAB contest log sheets. These can be obtained from the WAB contest manager D. Roberts, G4FQO, 12 Chestnut Avenue, Cranwell, Sleaford, Lincs NG34 8HT, upon receipt of a large sae.

Awards. 1. Certificates will be awarded to the leading contestants in each class of entry, and to the leading contestants from each DXCC country outside the UK.
2. The Lochinvar Trophy, which is held for one year, is awarded to the winner of the single-operator class in the lower frequency phone contest.
3. The President's Trophy, which is held for one year, is awarded to the operator with the highest total of trophy points at the end of the WAB contest year. Trophy points are awarded to the top five entries in the single-operator section of each contest on a scale of 10, 8, 6, 4 and 2 points.

Closing dates. Entries must be postmarked not later than one calendar month after the contest and must be received by the contest manager not later than 40 days after the contest.

Scoring (Fixed stations).
1. *QSO points*
a) Five points for each completed QSO.

b) Each station can only be worked once on each band for QSO points.
2. *Multiplier points*
a) One point for each different WAB area worked.
b) Each WAB area can only be worked once on each band for multiplier points.
c) One point for each different overseas country worked, as listed in the DXCC list, with the following exceptions:
1. Alderney, Guernsey, Jersey and Sark count for one point each.
2. From the prefixes G, GD, GI, GM and GW, only one of the five can be counted for one point.
3. In the 144/432MHz contest only, each of the prefixes G, GD, GI, GM and GW can be counted separately for one point each.
d) Each different overseas country together with the exceptions can only be worked once on each band for multiplier points.

Scoring (Mobile stations).
1. *QSO points*
a) Five points for each completed QSO.
b) From each WAB area activated a station can only be worked once on each band for QSO points.
2. *Multiplier points*
a) One point for each different WAB area activated.
b) Each different WAB area can only be activated once on each band for multiplier points.

Scoring (SWL stations).
1. *QSO points*
a) Five points for each different station heard.
b) Each station can only be claimed once on each band for QSO points.
2. *Multiplier points*
a) Multiplier points scoring is the same as for fixed stations. Insert "heard" for "worked".
3. SWL entries must consist of stations participating in the WAB contests and giving callsigns, reports, serial numbers and areas which must be logged.

Scoring (General).
1. The claimed score is obtained by multiplying the total number of QSO points obtained on all bands by the total number of multiplier points obtained on all bands.

Extra conditions. It is a condition of entry that the decision of the WAB committee shall be final in all cases of dispute.

Results. WAB contest results will be notified to the RSGB with a request for publication and will also appear in the WAB newsletter. A detailed results sheet will be available from the WAB contest manager upon receipt of an sae. Certificates will be posted to the winners and trophies will be presented at the WAB AGM at the Drayton Manor Rally.

Mobile rallies calendar

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

10 April—Swansea ARS Rally. Patti Pavilion, Swansea, (next to St Helens Cricket Ground on A4067 Swansea-Mumbles coast road). Open 10.30am-5pm. Trade stands. RSGB books, local repeater groups, bring & buy, licensed bar, refreshments, hf station and S22 talk-in. Good car parking. Further details from GW4HSH, QTHR, tel 0792-404422.

10 April—Lough Erne ARC Mobile Rally. Killyhevlin Hotel, near Enniskillen. Opens 12am. Talk-in on S22. Trade stands, book stall, bring & buy, films for children, boat trips, full hotel facilities, plus snacks. Further information from GI4CZW, QTHR.

10 April—East Cleveland ARC Mammoth Bring & Buy. The Leisure Centre, Marske-by-the-Sea. Open 11am. Talk-in on S22. Free use of stalls, clothing and footwear at spring clearance prices. Bring the family. For details send sae to sec Ken Turner, G8JLA, QTHR.

24 April—Drayton Manor Mobile Rally. Drayton Manor Park, Tamworth, Staffs. Organized by Midland ARS and Stourbridge ARS. Trade stands, Raynet, BM/CB, Repeater group, RSGB books, tombola, children's entertainments, side shows, refreshments, flea market. Organizer N. Gutteridge, G8BHE, QTHR, tel 021-422 9787, publicity organizer T. Brady, G8GAZ, QTHR, tel 021-357 1924.

1 May—Maidstone YMCA ARS Mobile Rally. Y-Sportscentre, Melrose Close, Cripple Street, Loose Road, Maidstone. For details and stand bookings contact G3ISD, QTHR, tel Sittingbourne 77431.

8 May—Lincoln Hamfest, organized by the Lincoln Short Wave Club. Lincolnshire Showground, (four miles north of Lincoln City on the A15). Opens 11am-5.30pm. Talk-in on 144MHz (S22) and 432MHz (SU8). Ample car parking, refreshments, licensed bar. Many attractions for junior ops. Facilities for the disabled. Further details from G8VRJ, c/o City Engineers Club, Central Depot, Waterside South, Lincoln.

8 May—Mid-Ulster ARC Mobile Rally. Parkanaur House. Open 12 noon. Trade stands, refreshments, entertainment for the family, bring & buy, flea market and homebrew competition. Details from Danny Cambell, GI4NKD, QTHR.

15 May—Northern Mobile Rally. The Great Yorkshire Showground, Harrogate. Organized by the Otley ARS. Doors open 11am (10.45am for wheelchair and blind visitors). Many attractions: Punch and Judy, films for junior ops, bring & buy stall, licensed bar, and excellent refreshments. Talk-in on vhf and uhf. Further details from G4KDV (G8DFZ) QTHR, tel 0943 463083.

15 May—Swindon & DARC Mobile Rally. Park School, Marlowe Avenue, Swindon, Wilts. Open 10am. Talk-in on 144MHz (S22) and 432MHz (SU8). Many trade stands. Film shows for children, and other displays of hobbies from groups in the area. Ample car parking, and refreshments. Details from K. A. Saunders, G8SFM, QTHR, tel 0666 89307.

22 May—Barry College of Further Education RS Welsh Amateur Mobile Rally. Memorial Hall, Barry. Open 11am to 5pm. Talk-in on S22, licensed bar, refreshments, bring & buy. Enquiries to Reg Rowles, GW4FOM, tel Cardiff 565656.

22 May—RATEC 83 Radio Rally. Woodford, nr Manchester, off the A5102. Open 11am-5pm. Talk-in on S22, 145·550, fm. Bring & buy, catering and bar facilities. Overnight camping and caravan parking by arrangement. Details from G3VFP, tel 061-439 2377.

29 May—Plymouth RC Rally. Tamar School, Paradise Road, Stoke, Plymouth. Opens 10am. Talk-in on S22 and SU8. There will be a variety of trade and general interest stands, and light refreshments and bar facilities will be available. Routes to the rally will be clearly signposted, and maps covering main routes to the rally are available on receipt of an sae from the rally secretary, G6EON. Further details of the rally from the organizer, G6EQM, QTHR, tel Plymouth (0752) 20224.

29 May—East Suffolk Wireless Revival. Civil Service Sports Ground, Bucklesham, nr Ipswich. Traders, non-radio stalls, attractions for all the family. Fleamarket and car boot sale (instead of "bring & buy"). Details from Jack Tootill, G4IFF, 76 Fircroft Road, Ipswich IP1 6PX, tel 0473 44047.

5 June—Spalding & DARS Mobile Rally. Springfields, Spalding. Open 11am. S22 and SU8 talk-in. Bring & buy stalls, 25 acres of gardens, bars, restaurants. Details from I. Buffham, G3TMA, QTHR.

12 June—Elvaston Castle Mobile Rally. Elvaston Castle Country Park, 5 miles south-east of Derby on the B5010. Organized by the Nunsfield House ARG. Opens 10am. Talk-in on 144 and 432MHz by GB2ECR. All the usual facilities including full on-site catering facilities. Further details from Ian Cage, G4CTZ, QTHR, tel Derby (0332) 799452. Trade enquiries to Mr R. Woolley, G4HIJ, QTHR, tel Ashbourne 43241.

12 June—RNARS Mobile Rally. HMS Mercury, nr Petersfield, Hants. Opens 10am-5.30pm. Refreshments will be available all day. Arena events, and trade stands. Details from G4DIU, QTHR.

19 June—Denby Dale & DARS Mobile Rally. The Shelley High School, Skelmanthorpe, nr Huddersfield. Open 11am. Something for all the family including excellent refreshments and bar. Details from J. Clegg, G3FQH, QTHR, tel 0484 862390.

26 June—Longleat Mobile Rally, Longleat Park, Warminster. Preliminary enquiries to G4FRG or G8GLQ, both QTHR.

10 July—Worcester & DARC Annual Mobile Rally, Droitwich High School, Ombersley Road, Droitwich. Open 11am-5pm. Attractions will include "strawberry fields", fancy dress competition, model aircraft displays. Details from rally manager, Brian Jones, G8ASO, QTHR, tel Worcester 351565.

17 July—RAIBC Picnic, The Fairground, Broadlands Estate, Romsey, Hants. Talk-in on S22. Details from G4COM, QTHR, tel 0703 693017.

17 July—Sussex Mobile Rally. Brighton Raceground. 10.30am to 5pm. Special event station GB2SMR will be in operation. Lots of attractions including free mini-bus trips to Brighton beach. Popular bring & buy. Many attractions for all the family. Unlimited free parking. Details from G4HUJ, QTHR, tel Worthing 200572, or office hours, Brighton 600235.

17 July—Cornish Mobile Rally. Cornwall Technical College. Full details from pro Simon Rodda, Cliff Hotel, Penzance TR18 2HH, tel Penzance 3948.

24 July—Anglian Mobile Rally, Stanway School, Colchester, Essex. Open 1000 to 1700. Talk-in on 144MHz. Further details from G3YAJ, tel 0206 39 3938.

24 July—McMichael ARS Mobile Rally, Bells Hill, Stoke Poges, nr Slough. Open 10am. Trade stands and fleamarket. ATV exhibitions, hf station, S22 talk-in. Details from David Cochrane, G8IHF, c/o McMichael Ltd, Wexham Road, Slough, Berks SL2 5EL.

31 July—Rolls Royce ARC (Barnoldswick) Mobile Rally, Sports & Social Club, Barnoldswick. Open 11am. Details from Leslie G. Logan, G4ILG, QTHR.

7 August—RSGB National Mobile Rally, Woburn.

14 August—Derby Mobile Rally. Lower Bemrose School, Derby. Further details nearer the date. Details from G4EYM, tel Derby 556875.

28 August—BARTG Rally. Sandown Park Racecourse, Esher, Surrey. Details from Edward Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston-upon-Thames, Surrey.

28 August—Torbay Mobile Rally. Details from club sec Mrs M. Rider, 7 Kingston Close, Kingskerswell, Devon TQ12 5EW. Tel 0804 75130.

28 August—Preston ARS 15th Annual Mobile Rally. Note new venue at Lancaster University. Easy access, ample free parking, and free admission. Leave M6 at junction 33 and proceed north on A6 for 2 miles. Open 11am. Talk-in on 144MHz fm S22. Cafeteria. Licensed bar on campus. Bring & buy. All enquiries to Mrs D. Stevens, 13 Arrowsmith Close, Hoghton, Preston PR5 0DV, tel Hoghton (025485) 3304.

11 September—Telford Mobile Rally. Extensive venue as before: Town Centre Malls, Telford, Shropshire. Varied attractions, full catering, licensed premises on site, plus about 80 trade stands. Free entrance and parking. Further details from G8DIR, tel Shrewsbury 64273; G8UGL tel Telford 584173, or G3UKV, tel Telford 55416.

11 September—Vange Mobile Rally. St Nicholas School, Nicholas Lane, Basildon. Open 10am. Talk-in on 144MHz (S22). Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

18 September—Peterborough R&ES Mobile Rally. Wirrina Sports Stadium, Bishops Road, Peterborough. Situated on the river embankment with good car parking, good food, and bar meals, with bar in the adjacent Gildenburgh rooms. Open 10.30am-5pm. Details from D. T. Wilson, 4 Conway Avenue, Peterborough, tel Peterborough 76238.

25 September—Harlow Mobile Rally. Harlow Sportcentre, Hammarskjold Road, Harlow. Doors open 10.30am. Bring & buy stall, refreshments and licensed bar, good parking, special interest stands. Talk-in on vhf/uhf. Details from G8FRG, QTHR.

Special event station

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

14 May, GB2WEC
The Bournemouth & D RAIBC will be operating the station from the Old Power Station, Bargates, Christchurch, Dorset—the home of the Wedgwood Electrical Collection. The power station will be open to the public from 10am to 5pm while the station is on the air. Talk-in will be available on vhf, and the station will be active on 144MHz fm, 28, 21, 14 and 3·5MHz cw and ssb. A special QSL card will be available. These will be sent via the RSGB or direct if an sae is sent to Bob Burrows, G6DUN, QTHR, tel 0202 474305, from whom further details may be obtained.

Looking ahead

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

24 April—Amateur Radio Convention; The Plessey Co Ltd, Martin Road, West Leigh, Havant, Hants.
8 May—RSGB Region 19 ORM, The Ashmore Centre, Burleigh Gardens, Southgate, London N14.
22 May—BATC ATV Exhibition, The Post House, Leicester.
27 August—Scottish Amateur Radio Convention. Cardonald College, Mosspark, Glasgow, followed by dinner/dance in Bellahouston Hotel, organized by West of Scotland ARS. Details from GM4JDU, QTHR.
15-16 October—EI—GI Convention, Ballymascanlon.

COUNCIL PROCEEDINGS

A brief report of the Council meeting held on 15 January 1983

Present: Mr D. E. Baptiste, CBE (President, in the chair), Dr E. J. Allaway, Messrs R. G. Barrett, K. A. M. Fisher, F. D. Hall, L. N. G. Hawkyard, Mrs J. Heathershaw, Messrs H. M. Holmden, G. R. Jessop, I. J. Kyle, T. I. Lundegard, W. J. McClintock, H. S. Pinchin, D. M. Pratt, K. E. V. Willis (members of Council), D. A. Evans (secretary/general manager) A. W. Hutchinson (editor), and Mrs H. M. Allin (minutes secretary).

The President welcomed all present at this, the first meeting of 1983, especially new Council members Messrs Holmden and Willis.

Apologies were received from Messrs Bazley and Cornish.

Committee terms of reference
The President outlined the current situation regarding the changes to committee terms of reference.

A meeting between the Forward Planning Group and committee chairmen was to be held on 5 February, with a view to obtaining feedback on the committees' reactions to the changes and to arrange dates of future meetings. It was planned to discuss forward planning with various groups of chairmen. It was noted that existing chairmen and officers would remain in office until the end of June.

Financial report
A brief report was given by the secretary/general manager in the absence of the honorary treasurer. Mr Evans said it was regrettable that Mr Cornish was unable to be present, but he had been forced by ill-health to reduce his commitments during recent months. He was, however, very active behind the scenes.

Mr Evans reported that the £135,000 in respect of 35 Doughty Street had now been secured, following successful application for the "established use" and planning certificate.

Mr Baptiste said he felt that this was a matter for great congratulation and he undertook to write to Mr Cornish on the Council's behalf, expressing its appreciation.

Secretary's report
The secretary/general manager commented on the fact that Dick Baldwin, W1RU, and his wife would be attending the Presidential Installation later in the evening, and said that the Society was most honoured to have the President of the IARU as a guest.

Mr Evans then reported:

(i) that the present membership of the Society was approximately 33,600, and during the first six months of the present financial year membership had increased at a rate of approximately eight per cent per annum;
(ii) on new staff engaged since headquarters moved to Potters Bar;
(iii) that the changeover to the new IBM38 cpu data base management system was now some third of the way through, the end of March being the target date for completion;
(iv) that the basement packing and storage area had now been completed and all Society book stocks were now located at Potters Bar. This movement of stock had considerably reduced the management logistics problems which were associated with stock spread around the country. It also meant that stock control and stock checks were now much easier and quicker.

Committee recommendations
HF
"That in order to stimulate activity on 28MHz during periods of low sunspot activity, the RSGB should initiate a British 10m County Award".
Agreed.

HF Contests
"Regarding the bequest from G6VQ for a trophy for BERU, that Council accepts the offer and a suitable trophy be purchased for presentation to the winner of the 21MHz CW Contest and that this trophy be given a suitable name. It was recommended that a number of cups be purchased for retention by overseas winners." Agreed. Council's suggestion for reference to G6VQ in the naming of the trophy would be put to the committee.

IARU HQ
Proposals concerning the admission of the Dominica Amateur Radio Club and the Lesotho Amateur Radio Society were approved, as was the election of Mr N. B. Eaton, VE3CJ, as IARU President Emeritus.

Membership and representation
Reduced subscriptions in respect of three members were noted.
Waived subscriptions in respect of five members were noted.

Details of the vacancy for the position of RR10 would appear in the March issue of *Radio Communication*.

The appointments of the following area representatives were noted:

G. G. Brooks, GM4NHX.....Caithness
R. G. J. Burnside, RS45534..Belfast
B. Q. Deans, RS50800.....Dundee
A. R. Evans, GW4HDR.....Rhyl and district
A. Leaver, G4ECB.....Pendle and district
A. D. Ralph, G8XLH.....Medway towns

Election of executive vice-President
Dr Allaway proposed that Mr Barrett continue in this office during 1983. This was seconded by Mrs Heathershaw, and carried unanimously.

Election of Council member
Following Mr Bellerby's resignation from Council, a casual vacancy existed until the end of 1983. Mr Baptiste said he felt that the proper course of action would be to appoint Mr G. A. Griffiths, G3STG, who was runner-up in the Council election.

No other nomination was forthcoming, and Mr Jessop proposed that Mr Griffiths be co-opted on to Council. Mrs Heathershaw seconded this proposal, which was agreed.

Committee expenses
Mr Lundegard introduced this item, suggesting that a detailed breakdown of committee/Council expenses be submitted annually to Council.

Some discussion ensued. There was some agreement with the principle that a committee chairman should be better informed as to the cost of his committee. It was also felt that it was the job of the Finance & Staff Committee to keep close scrutiny on committee/Council expenses, drawing Council's attention to anything it felt excessive.

Mr Evans added that the honorary treasurer had always kept this area under extremely good control.

Mr Baptiste assured Council that this matter would be borne in mind at the meeting between the Forward Planning Group and committee chairmen.

Committee attendances
Mr Lundegard felt that details of committee attendances during the year should be published in *Radio Communication* for general information.

After a short discussion, it was agreed to ask chairmen to include such information in their annual report.

Society's 75th anniversary
Consideration was given to a letter from Mr J. Swinnerton, G2YS, in which he suggested ways in which the Society could commemorate this milestone.

It was agreed that this was a matter for the Forward Planning Group, and Council members were requested to submit ideas for the group's attention.

Honorary officers' reports
HF manager
It was noted that this post was now vacant.
Mr Fisher proposed that Dr Allaway be asked to resume this role. This was seconded by Mr Barrett and agreed.

VHF manager
Mr Fisher reported on the following topics:
50MHz licences; the possibility of a number of new repeaters; communication with AMSAT regarding liaison between RSGB and satellite groups; Project "X"; a hoped-for improvement in the use of 145.8-146MHz; and that a submission to the Merriman Committee was being finalized.

Amateur radio in the Falkland Islands
Dr Allaway outlined the Society's previous efforts to assist radio amateurs in the Falklands. A letter had now been received from Flt Lt J. S. Kirk, G4LPQ, suggesting the supply of repeaters, and offering to assist with the project.

Some discussion ensued on the implications of this suggestion.

Mr Willis agreed to draft a letter to Mr B. Ethridge, Superintendent of Posts & Telecommunications, with copies to G4LPQ and VP8NO. In the meantime the secretary/general manager would approach the Home Office to ascertain frequency allocations in the Falklands.

Proposed Official Regional Meeting
Mr Baptiste drew attention to a letter from Mr R. Broadbent, G3AAJ, Region 19 representative, requesting Council's permission to hold an ORM in May. This would be passed to the M & R Committee for action.

EI/GI Convention
Mr Kyle extended invitations to the President and secretary to attend the EI/GI Convention to be held on 8/9 October.

OBITUARIES

The Society records with regret the deaths of the following radio amateurs:

Mr C. Bradley, G8UTU
Chris Bradley, who died recently, was very active on 144MHz fm until ill-health prevented him from continuing. He was well known on the local nets and repeaters. He was a founder member of St Neots & DARS.

Mr S. Bruce, G8NSB
Sid Bruce, a founder member of St Neots & DARS, who died recently, was mostly active on 144MHz. He was especially keen on mobile and portable work, operating on ssb from his car. His car was known to local amateurs as "The Hedgehog" because of the number of fixed antennas it carried. He was also an enthusiastic mobile rally attender.

Mr A. J. Crookes, G3ALV
Mr Crookes died on 20 November 1982, aged 74. He was a sea-going operator in the 'twenties on cable-laying ships, and became an amateur after the second world war. He had been an RSGB member for 40 years. He worked as an electronics technician at a local college until three years before his death.

Mr A. G. Davies, G2PC
Alan Davies died on 1 January, aged 82. He was mainly interested in cw operation, and had been a first class operator since 1923.

Mr H. Effemey, G3LS
Harry Effemey, who died on 12 November 1982, aged 62, was first licensed when he was 15. During the second world war he designed aircraft antennas. He had worked at University College, London, with Professor Barlow, and was a lecturer specializing in microwave techniques. Until his death he had been experimenting with QRP, and was a member of the G-QRP Club. Recently he had programmed the ZX Spectrum computer for sending and receiving cw, and was perfecting a program for rtty.

Mr J. E. Grace, G3EYM
Jack Grace died on 20 December 1982. Active on hf and vhf until the time of his death, he was a senior project engineer in the electronics industry. For the past three years he had been one of the lecturers covering the RAE syllabus at Riversdale Technical College in Liverpool, and was always keenly interested in the progress of his students.

Mr J. C. Graham, G3TR
John Critchley Graham, G3TR, died on 19 February 1983 at the age of 75, at the end of a life full of variety and achievement, including his Presidency of the RSGB in 1968.

He became a radio enthusiast in the 'twenties, and nearly 60 years ago he held the AA call 2BQR, and he became GM3TR in 1938. Since then, apart from the war, the call G3TR has been one of the most noted dx stations on the hf bands, and in recent years John made a host of friends in VK and ZL where the 204 BA usually came to rest. Many a VK will tell you that if he could not hear G3TR he knew the band was not open. In addition to dxing, John was a keen contest operator; his achievements were many, among them the winning of the Whitworth Trophy for the RSGB 21/28MHz Contest. Defying the effects of advancing years and a serious handicapping illness, his call appeared in 16th place in the same contest in 1982.

John's services to the Society and to clubs was a notable feature of his life. Seven years on Council involved the normal committee membership, but his work on the HF Contests Committee as member and chairman was perhaps dearest to his heart. G3TR had a spell with the RSGB Group in Southampton before moving to Crawley, where he was quickly roped-in to be chairman of the newly-formed Crawley ARC. For nearly 25 years, up to his death, John served on the club's committee, first as chairman and then as honorary life president. He was made an honorary member after 20 years service and he devoted all his efforts to the wellbeing and success of the club.

His working life was spent chiefly in air traffic control, where he was a pioneer of this new service; his control officer's licence was No 13 and his duties took him to aerodromes all over the British Isles; his final appointment was as Chief Officer and Air Traffic Control Officer-in-Charge at Gatwick Airport.

His private life extended from flying to motorsport, ballroom dancing to angling, and included potholing, ski-ing, golf and tennis as major pursuits.

John Graham leaves behind him a tremendous number of friends, in Australia as well as in Britain, who will mourn the loss of one they admired and loved.

G3YVR

Mr L. W. Holman, G3OXZ
Bill Holman died on 9 December 1982. he was always active at the Stoneleigh Town & Country Festival, giving vhf, hf and tv demonstrations.

Mr D. H. Johnson, G6DW
Douglas Johnson died on 25 January at the age of 75. He was a solicitor by profession and was at one time honorary solicitor to the RSGB.

He was first licensed, while still at school, in 1923, and in 1935 he was granted special permission by the GPO to act as an unofficial home-base station and to pass private messages from the members of the Oxford University Arctic Expedition of 1935/6 to Northeast Land, and to relay reports of the ionospheric soundings to the Royal Society. G2BQ, who was the operator with the expedition, writes:

"Douglas and I had arranged that we would try to get in touch every four hours over a three-day period each month. This proved more of a strain than I had bargained for. I remember that the first time I heard him was on the last sked of the second or third month, but in the following month we got two-way contact perfectly and maintained it easily all through the winter and well into the time when we had continuous daylight again in 1936. In Northeast Land, 80° N, the sun sets for the year on 18 October, not to be seen again until late in February. By the end of April the sun is up all the time."

During the second world war, Douglas was a member of the Radio Board whose task was to maintain liaison on radio matters between the War Cabinet, the Ministries and industry. He was a member of a technical mission to Washington, and received the USA Medal of Freedom. After the war he devoted all his spare time to amateur radio, and over the past 25 years there can have been few days when he was not "on the air" to some remote part of the world. He had friends everywhere, especially in VK and ZL land where, over the years, he had had contact with over 500 separate stations, many of them on numerous occasions. He was on the air just two days before he died. A fine old English gentleman who will be missed by all who knew him.

G5CS

Mr R. W. H. Manley, G4BJW
Bob Manley died on 28 January. He was a past treasurer of the Bristol RSGB Group, and had obtained his licence in 1972, having learnt his morse as an RAF operator during the last war. He passed on these skills to many of the Bristol Shirehampton ARC during his membership there. He became a founder member of the North Bristol ARC in 1977, and admirably guided the finances of that club as honorary treasurer until his death. He was active on the hf bands, particularly in local nets, and was a regular participant in club field day events.

J. H. Payton, G2JB
John (Jack) Payton died on 22 January, aged 74. He was first licensed for an artificial aerial in 1926, and then under the call G2JB in 1930-1. He was continually active until his death, and was an RSGB member from the start. He served in the RAFVR prior to the second world war, and actively in the RAF from 1939-45 as a radar mechanic. He was active on 5m in its days, and was a very keen and knowledgeable constructor. More recently he had been active on both cw and ssb on all bands from 3·5 to 28MHz. He had a great interest in the German language, and conducted regular and frequent QSOs and skeds with his many friends in Germany.

Mr J. Prestidge, G2BXP
Jack Prestidge died on 5 December 1982. He joined the RSGB in 1932, and was licensed as 2BXI. After returning from service in Egypt he was re-licensed as 2BXP. By 1948 he had worked 100 countries. He was well known in the West Midlands on 144MHz, and was a member of the RAIBC net.

Mr H. A. Sladin, G4HNI
Alistair Sladin died on 20 November 1982. Although interested in radio from before his teens, he did not apply for a licence until recently. He always built his own gear, and enjoyed QRP work even under present conditions on the hf bands. (G5LR remembers well being taught morse at school by Alistair in English lessons, when an unobservant form master, two wires along the heating pipes at one side of the room, a lamp at each end, a morse key and battery at Alistair's end, and a Meccano strip on wood at the other end produced poor results in English school certificate, but fine morse!)

Mr G. Smith, G3GMI
George Smith died on 11 February. He had been a founder member of the "Dad's Army" net.

Mr L. R. Watson, G4FDY
Les Watson died on 28 September 1982. He was an active and popular member of the Cray Valley RC, and although active on all hf bands he preferred 3·5MHz. He was the local representative for RAIBC, and was responsible for the "talking book" scheme in his area.

YOUR OPINION

TWO VIEWS ON AMATEUR RADIO TODAY
The Editor
Radio Communication

Sir—Since the amateur service was introduced there have been many changes to the conditions of the amateur licence. The scrapping of the "first year on cw" rule, the introduction of the Class B licence, ptt operation without repeated callsign identification, and third-party traffic between Scouts are examples of the sort of freedom that has been given to the amateur service. I soon expect to see full relaxation of third-party traffic restrictions, scrapping of the morse test and the introduction of phone patching.

I do not think that such change is surprising, but I do view this liberalization as ultimately devaluing the amateur licence to a point where the layman will, not surprisingly, have some trouble understanding the differences between the objectives of the amateur service and the objectives of cb radio. Such a layman may be your next-door-neighbour or a government minister deciding the fate of our 28MHz or 70MHz allocation.

As things stand today, getting an amateur transmitting licence is easy. Anyone with the ability to pass examinations and a little spare time to study an RAE correspondence course stands a good chance of passing first time—or second time with certainty. Without any swl experience, nor having ever used a soldering iron, our novice fills in a form, buys a few black boxes (complete with leads!) and it is "G7ZZZ for a copy".

Years ago there was a natural progression from swl to licensed amateur. There was swling itself, which often involved hours of experimentation with elderly receivers. Frustration when attempts to peak the i.f. transformers resulted in a total loss of signals. Building add-on Q multipliers and replacing obsolete valve rectifiers with semiconductors, and so on. The biggest hurdle for most novices was the morse test. This was the real test of keenness. Failure to persevere at this stage would mean no transmitting licence. Morse code transmission and reception is a skill that any keen able-bodied person can acquire. Perhaps a little outmoded these days, but nevertheless a test of keenness. It was the need to listen for morse code transmissions that ensured that no novice could bypass the swling phase of his or her education. And no novice wanted to bypass it.

With the changing times we have ended-up with a significant number of appliance operators who have little understanding of the equipment that they operate. If you inform someone these days that his ssb black box is splattering, you'll probably find that he does not have a monitor receiver to check your report. Worst of all, he would not know what to listen for anyway.

I am bound to wonder whether liberalization of the amateur service is necessary to further amateur radio or simply to increase RSGB membership.

Steve Rawlings, GW4ALG

Sir—As a newcomer to this very fascinating hobby, may I be permitted to make a few observations.

It would appear to the writer that interest in amateur radio has grown very fast in the UK in the last two or three years. Many of the newcomers appear to be like myself: that is, from a non-electronics or non-radio background, and we accordingly are putting more pressure on the RSGB for a standard of service and technical advice not previously required.

On the other hand some of the older members believe that any amateur worth his salt should be able to design and build his own remotely-controlled, atomic-powered radio communication satellite on the kitchen table. This attitude may have been more understandable 30 or more years ago, when it may have been feasible for the average amateur to make a "rig" comparable with those then available on the contemporary commercial market, but I would suggest that very few amateur builders could turn out anything to compare with, say, a Yaesu 101 or a Trio 830. Many of us don't wish to try, and why should we?

If many members wish to use their new-found skills and qualifications to merely play as glorified cbers, then let them—provided that they obey the obvious regulations *vis-a-vis* advertising, obscenities, interference etc—then that surely is up to the individual. It must, I would have thought, be up to the hobbyist him or herself to decide how much he or she feels able to put into or take out of amateur radio. On joining the RSGB, I was not given the impression that technical skills were the absolute order of the day, quite the reverse.

This brings me to the RAE itself. I started studying for it from the books recommended by the RSGB (who have always been patient and helpful to me, even before I was a member) in February 1982, and acquired the necessary standard to pass the May examination. Coming from a non-academic environment, I found it hard, and I find obtaining the necessary morse skills also hard. I would suggest that for me and my "ilk" the RAE is quite hard enough. There is no doubt in my mind that we are paying a high enough price in effort and time in order to join the band of the G4s and G8s etc.

M. S. Stewart

RSGB SLOW MORSE PRACTICE TRANSMISSIONS

Alterations and additions to this list should be sent to the organizer Mr M. A. C. MacBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex

Clock time	Callsign	MHz	Mode	Town	Notes
Sundays					
1015	G3CGD	1·875	A1A/A3E	Cheltenham, Glos	
1100	G2FXA	1·910	A1A/A3E/J3E	Stockton-on-Tees	
1100	G4PUD	145·425	F2A	Birmingham	[1]
1100	G3BLS	145·250	F2A	Osney, Oxford	[1]
1130	G4BFJ / G4DKK	144·625	F2A/F3E	Banstead, Surrey Tooting, SW London	
1200	G3PER	145·575	F2A/F3E	Heysham, Lancs	[1]
1200	G3HVI	145·250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
1200	G3GNS	1·910 / 3·550 / 144·250	A1A / A1A / 1A	Locking, Avon	[13]
1830	G4GOC	145·250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
1830	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1930	G3LDW	144·160	A1A/J3E	Halesowen	[1]
2005	G3OLU	145·375	F2A/F3E	Braintree, Essex	
2100	G4EWK	144·850	F2A	Burton-on-Trent, Staffs	[7]
2100	GW4LLE	145·525	F2A/F3E	Haverfordwest, Dyfed	
Mondays					
1100	G4IRI	3·550	A1A/J3E	Bolton, Lancs	
1830	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1900	G3GC	3·562	A1A/J3E	Yeovil, Som	
1900	G3TPY	145·275	F2A/F3E	Chester, Cheshire	[1]
1900	G4ILD / G3ZQS	145·400	F2A/F3E	Rishton, Lancs / Darwen, Lancs	[1]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1930	G4BFJ / G4DKK	144·625	F2A/F3E	Banstead, Surrey Tooting, SW London	
1930	GI3SXG	144·100	A1A/J3E	Newtownards, Co Down	
1930	G4LLU / G4JSQ	144·160	F2A/F3E	Wolverhampton, W. Midlands	[1]
2000	G2FXA	145·525	F2A/F3E	Stockton-on-Tees	[1]
2000	G4IRI	3·550	A1A/J3E	Bolton, Lancs	
2000	G4PYR	145·250	F2A/F3E	Solihull, W Midlands	[2]
2030	G3ASR	1·875 / 144·175	A1A/J3E / A1A/J3E (lsb)	Harrow, Middx	[1] [12]
2030	G2FKO	145·525	F2A	Bideford, Devon	
2100	G3WOR	144·250	A1A/J3E	Lancing, Sussex	[14]
2200	G3GMS	3·583 / 145·250	A1A / F2A/F3E	Whitley Bay, T & W	[1]
Tuesdays					
1100	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1200	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1830	G4CWN	144·100	A1A/J3E	Stoke-on-Trent, Staffs	
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1900	G4RS	3·565 / 145·525	A1A/J3E / F2A/F3E	Catterick, N Yorks	[1]
1930	G4BFJ / G4DKK	1·950 / 144·625 / 144·625	A1A/J3E / F2A/F3E / F2A/F3E	Banstead, Surrey Tooting, SW London	
1930	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1930	G4DAL	145·575	F2A/F3E	Lancaster, Lancs	[1]
2000	G3VHE	145·350	F2A	Swindon, Wilts	[1]
2000	GM4ELV	144·250	A1A	Arrochar, Strathclyde	
2000	G4FEX	145·250	F2A/F3E	Horsley Woodhouse, Derbyshire	[1]
2030	G4PDP	144·250	A1A/J3E	Biggleswade, Beds	[1]
2030	G3IRM	1·975	A1A/A3E	Bury St Edmunds, Suffolk	
2030	G3OHM/A	144·180	A1A/J3E	Birmingham	
2030	G3KGU	1·910	A1A/A3E	Theydon Bois, Essex	
2030	G2FKO	145·525	F2A	Bideford, Devon	
2100	G4EWK	144·850	F2A	Burton-on-Trent, Staffs	[7]
2200	G3AWL	144·110	A1A/J3E	Easington, Co Durham	[8]
Wednesdays					
1100	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1830	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1900	G3TPY	145·275	F2A/F3E	Chester, Cheshire	[1]
1900	G4ILD / G3ZQS	145·400	F2A/F3E	Rishton, Lancs / Darwen, Lancs	[1]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1900	G2ABC	145·250	F2A/F3E	Truro, Cornwall	
1900	G3ULY / G4EXD	3·583 / 145·475	A1A / F2A	Culgaith, Cumbria	[1]
1930	G4NNS / G4BFJ / G4DKK	144·625	F2A/F3E	Sunbury-on-Thames, Middx / Banstead, Surrey / Tooting, SW London	
1930	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1930	G4FKH	3·550	A1A	Chelmsford, Essex	[1]
2000	G2FXA	144·250	A1A/J3E	Stockton-on-Tees	[1]
2000	GW4KDP	145·550	F2A/F3E	Barmouth, Gwynedd	[1]
2000	G3SWP	145·250	F2A/F3E	Doncaster, South Yorks	[1]
2000	G4BP/A	145·475	F2A/F3E	Scarborough, Yorks	[3]
2000	G4PYR	144·550	F2A/F3E	Solihull, W. Midlands	[4]
2030	G4LHI	145·250	F2A/F3E	Huntingdon, Cambs	[1]
2030	G2FKO	145·525	F2A	Bideford, Devon	
2100	GW4LLE	145·525	F2A/F3E	Haverfordwest, Dyfed	
2130	GM4HYF	28·350 / 145·375	A1A / F2A	SE Glasgow	[1]
Thursdays					
1100	G4IRI	3·550	A1A/J3E	Bolton, Lancs	
1830	G4GOC	145·250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
1830	G4ILD / G3ZQS	145·400	F2A/F3E	Rishton, Lancs / Darwen, Lancs	[1]
1830	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1900	G3TPY	145·275	F2A/F3E	Chester, Cheshire	[1]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1900	G4BNA	3·590	A1A	Swindon, Wilts	
1900	G3BLS	145·250	F2A	Osney, Oxford	[1]
1900	G3ZRZ	1·975	A1A/A3E	Blackpool, Lancs	
1900	G4RS	3·565 / 145·525	A1A/J3E / F2A/F3E	Catterick, N Yorks	[1]
1930	G4BFJ / G4DKK	1·950 / 144·625 / 144·625	A1A/J3E / F2A/F3E / F2A/F3E	Banstead, Surrey Tooting, SW London	[15]
1930	G3ASR	1·875 / 144·175	A1A/J3E / A1A/J3E (lsb)	Harrow, Middx	[1] [11] [12]
2000	G2ACZ	1·819	A1A	Mablethorpe, Lincs	
2000	G3IRI	3·550	A1A/J3E	Bolton, Lancs	
2000	GM4ELV	144·250	A1A	Arrochar, Strathclyde	
2030	G2FKO	145·525	F2A	Bideford, Devon	
2100	G3WOR	144·250	A1A/J3E	Lancing, Sussex	[14]
2100	G4EWK	144·850	F2A	Burton-on-Trent, Staffs	[7]
2200	G3GMS	3·583 / 145·250	A1A / F2A/F3E	Whitley Bay, T&W	[1]
2200	GM4HYF	28·350 / 145·375	A1A / F2A	SE Glasgow	[1]
Fridays					
1100	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1830	G4ILD / G3ZQS	145·400	F2A/F3E	Rishton, Lancs / Darwen, Lancs	[1]
1830	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1900	G3TPY	145·275	F2A/F3E	Chester, Cheshire	[1]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1930	G4ILW	145·550	F2A/F3E	Gateshead, T & W	[1] [16]
1930	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1930	G3HVI	145·250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
1930	G4BFJ / G4DKK	144·625	F2A/F3E	Banstead, Surrey Tooting, SW London	
2000	G3RR	145·550	F2A/F3E	Barnoldswick, Lancs	
2000	G3WOK	144·775	F2A	Hailsham, Sussex	
2030	G3CRA/A	144·625	F2A/F3E	High Wycombe, Bucks	[1]
2030	G2FKO	145·525	F2A	Bideford, Devon	
2200	G3AWL	144·110	A1A/J3E	Easington, Co Durham	[8]
Saturdays					
1200	G3GNS	1·910 / 3·550 / 144·250	A1A / A1A / A1A	Locking, Avon	[13]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
2000	G4JBB	145·425	F2A	Birmingham	[10]
2000	G4FEX	145·250	F2A/F3E	Horsley Woodhouse, Derbyshire	[1]
2030	G2FKO	145·525	F2A	Bideford, Devon	
2100	GW4LLE	145·525	F2A/F3E	Haverfordwest, Dyfed	

Notes

[1] Omnidirectional
[2] Horizontal to SE
[3] Vertical to S
[4] Horizontal to NW
[5] Vertical to E
[6] Tilted polarization NE to SW
[7] To SW
[8] To S
[9] To NE
[10] To NNE
[11] First and third Thursdays in each month
[12] Horizontal
[13] Reports to RAFARS Locking
[14] Horizontal to E and W
[15] Starting speed 12wpm
[16] Vertical to N

CLUB NEWS

Members of Bury RS talking to Warrington ARC during the inter-club quiz which they held via a two-way video link. The club believes this could be a "first" for the UK. L to r: Mike Bainbridge, G4GSY, the question-master; Fred, G3RSM; Alex, G6HBF; Clive, G8XUR; and Peter, G8OVT

The following is the latest information received by RRs from RSGB affiliated societies, clubs and groups in time for inclusion in this issue. Basic unchanged information on other affiliated organizations will be published in the July 1983 issue.

RSGB affiliated organizations are requested to report all programmes and news items to their regional representatives regularly. Information for inclusion in the **June** issue should reach them by **15 April** and for the **July** issue by **13 May.**

Club programmes are given in order of date, subject, time and place of the meeting. All callsigns of club secretaries and other contacts are QTHR (correct in the current *RSGB Call Book)* unless otherwise stated.

All clubs welcome visitors and would be pleased to hear from potential new members.

REGION 1—RR W. R. Parkinson, G3FNM. 141 Norris Road, Sale, Cheshire M33 3JR. Tel 061-973 1472.

Accrington (NW Repeater Group)—21 April, 8pm. Globe Bowling Club, Willows Lane, Accrington. Sec Howard Aspinall, G3RXH.

Barnoldswick (Rolls-Royce ARC)—6 April (Film show by Michael Crawshaw, G4BLH), 8pm. Rolls-Royce Sports & Social Club, Barnoldswick. Sec Leslie Logan, G4ILG, tel 0282 812288.

Blackburn (East Lancs ARC)—5 April (A talk on computers and amateur radio), 3 May (A talk on home construction technique), 30 April, 1, 2 May (Demonstration of amateur radio at the Salesbury Electronics Fair), 7.30pm. Shadworth Leisure Centre, Blackburn, for the two Tuesday meetings. PRO Graham Pountain, G4MWY, tel 0254 678933.

Bury (BRS)—12 April ("23cm and repeaters", by Dr Trevor Hopkins, G8TYY), 5, 19, 26 April (Informal meetings). The club recently held its first hamfeast and inter-club quiz via a two-way video link on 432MHz with the Warrington club. The former was attended by hundreds of amateurs from northern England. 8pm. Mosses Community Centre, Cecil Street, Bury. PRO Malcolm Pritchard, G3VNQ, tel 0706 355922.

Fylde (FARS)—The RR is very pleased to welcome this new club to the "Club news" feature. Meetings are at the Kite Club, Blackpool Airport, on the first and third Tuesdays in each month. The officers are chairman, John Parkinson, G6DNK; sec, Wally Poupard, RS50004; treasurer, Harold Fenton, G8GG, tel 0253 725717. 5 April ("Aircraft instrumentation", by John Kynaston, G4AHZ), 19 April (Informal evening), 3 May ("Certificates and awards: A serious facet of amateur radio or a foolish waste of time and money?" by Harold Fenton, G8GG), 7.45pm. Further information from Wally Poupard, 14 Beach Street, Lytham, tel 0253 734596.

Isle of Man (I o M ARS)—Changes are reported in the officers of the club as follows: president, Bob Morgan, GD3KGC; chairman, Stan Keyes, GD4BGK; treasurer, Ralph Furness, GD4IHC; sec, John Melling, GD4MNS. Mondays, 8pm. Keppel Hotel, Creg-Ny-Ba, alternating social with activity nights on vhf and hf with GD4IOM and GD3FLH. Stamped addressed envelopes sent for QSL cards are only valid if Manx postage stamps are used! Also would the GD holidaymakers please claim their cards for their GD calls from the club's sec.

Leyland (LHARG)—11 April, 7.30pm. Astley Park Sports Club, Hallgate, Astley Village, Chorley. Sec Arthur Jolly, G4JCO.

Liverpool (L&D ARS)—5 April ("Further aspects of the computer in amateur radio" by Al Neilson, G4CVZ), 12 April ("Japanese morse" by Norman Kendrick, G3CSG), 19 April ("Rescue", by Bill Lockyer), 26 April ("Forces portable equipment", by Ian Mant, G8AVJ), 3 May (Junk sale), 8pm. Wavertree Conservative Association, Church Road, Wavertree, Liverpool. Sec Gordon Purslow, G6MHG, tel 051-263 5837.

Liverpool (Sefton ARC)—The new club sec is Mike Webb, G6ICR, tel 051-487 0756. Alternate Wednesdays (from 23 February). 20 April (Talk and demonstration on the use of the micro computer in amateur radio, by Al Neilson, G4CVZ), also scheduled shortly is a "junk sale". Liverpool Prison Officers Social Club, in Hornby Place, off Hornby Road, Walton, Liverpool 4. The club station call is G4RAQ.

Manchester (South Manchester RC)—1 April (Club closed), 8 April ("Hifi", by Ben Young), 15 April (Contest techniques), 22 April ("Audio analysis", by Chris Ward, G4HON), 29 April (Home-built equipment contest), 8pm. Sale Moor Community Centre, Norris Road, Sale. Informal meetings, Mondays, in the shack. Sec David Holland, G3WFT, tel 061-973 1837.

Preston (PARS)—10 April (Fox hunt, commencing at 2pm), 14 April ("Satellite communications", by Dave Duff, G3VYV), 28 April (To be announced), 8pm. Lonsdale Club, Fulwood Hall Lane, Fulwood, Preston. Sec George Earnshaw, G3ZXC, tel 0772 718175.

St Helens (St H & D ARC)—6 April (Talk on receivers by Mark Edwards, G4LHL), 13 April (Talk by Eric Grossmith, G3WOH, subject to be announced), 7.30pm. Conservative Rooms, Boundary Road, St Helens. PRO Alan Manchester, G6FJU, tel 0744 56889.

Thornton Cleveleys (TCARS)—4 April (Easter Monday natter night), 11 April (Discussion on contests), 18 April (Beginners night and quiz), 25 April (Demonstration of the club station and discussion on operating techniques), 7.45pm. Norbreck 1st Scout Group Hut, Carr Road, Bispham. Sec Mrs Jen Ward, tel 0253 890114.

Warrington (WARC)—5 April (AGM), 7.30pm. Grappenhall Community Centre, Bellhouse Lane, Warrington. Sec Chris Crotty, G4PDJ.

Warrington (UK FM Group Western)—7 April, 5 May. Grappenhall Community Centre, Bellhouse Lane, Warrington. Sec Gordon Adams, G3LEQ, tel 0565 4040.

Wirral (WARS)—6 April (Sale of surplus equipment), 20 April ("Getting on the air"), 4 May (Problems night), 7.45pm. Minto House School, Birkenhead Road, Meols, Wirral. Sec Cedric Cawthorne, G4KPY, tel 051-625 7311.

Wirral (W & D ARC)—13 April ("Amateur tv", by G6DBP and G3RLA), 27 April ("Passive df tips and wrinkles", talk and demonstration by G8UZZ and others), 8pm. Irby Cricket Club, Irby Mill Hill Road, Irby. D&W's 6, 20 April. Railway Hotel, Meols, The Harp, Neston respectively. Sec Gerry Scott, G8TRY, tel 051630 1393.

The RR thanks the following clubs for copies of their club magazines; Bury, South Manchester, Wirral Amateur, Wirral and District. He would also like to extend a welcome to two recently appointed area representatives, Albert Leaver, G4ECB, and David Yorke, G4JLG, for Pendle & District and Greater Manchester West and South respectively. *G3FNM.*

REGION 2—RR D. S. Smith, G4DAX, Red Roof, Goathland, Whitby, North Yorks YO22 5AN. Tel 094 786 333.

Doncaster (DMI of HEARC)—Mondays, 8pm. Gertrude Bell Hall, Church Street, Armthorpe, Doncaster. Sec Brian Coupe, G8GTG, tel Doncaster 770663. Club call is G3UER.

Goole (GR&ES)—5 April (Natter night), 12 April (Shortwave radio), 19 April (Visit to local factory), 26 April (DF event), 8pm. The Junior Chamber Buildings, Boothferry Road, Goole. Sec Richard Sugden, G8IOH, tel Reedness 462. Details from G8IOH or G8VHL.

Halifax (Northern Heights ARS)—6 April (AGM), 20 April ("RSGB", by G4DAX, RR2), 4 May (Visit to Leeds airport), 8pm. Bradshaw Tavern, Bradshaw, Halifax. Sec G6CJL. Club net frequency is 145·275MHz.

Halifax (H&DARS)—First and third Tuesdays in each month, 19 April ("AMSAT", by G4JJ), 7.30pm. Clairmount Liberal Club, Belgrave Avenue, off Clairmount Road, Halifax. Sec G4LEC, tel 0422 33080.

Harrogate (HRG)—Chairman G4ATZ. The licence has arrived. Unfortunately there are now site problems. Latest news from G4ATZ.

Hornsea (HARS)—Wednesdays, 14 April ("Meteor scatter", by G3CHH), 8pm. The Mill, Mill House, Atwick Road, Hornsea. Sec M. Willerby, G4MWE.

Hull (H&DARS)—Fridays, 8pm. RAE classes are held at 9pm, Fridays. West Park Recreation Centre, Walton Street, Hull. Following the AGM there is a new sec, R. Varey, tel 0482 54881.

Leeds (White Rose RS)—Wednesdays, 8pm. Moortown Rugby Football Club, Moss Valley, Alwoodly, Leeds 17. Club net, 8pm, Thursdays, 3·775MHz or 21·35MHz depending on propagation. Sec G3KWT. The AGM will be held on 11 May 1983. The club would like to thank all this year's speakers for their time and trouble. The club antennas are being uprated ready for the new contest season, which looks like being very busy.

Mexborough (M&DARS)—Fridays, 8 April ("RSGB" by G4DAX, RR2), 29 April (Spring dance). Many other talks arranged, 7pm. Harrop Hall, Dolcliffe Road, Mexborough. Sec Mrs G. Drohan, 5 Swinburn Avenue, Adwick-le-Street, Doncaster.

Pontefract (P&DARS)—7 April (Informal), 8pm. The Carleton Community Centre, Wakefield. Sec G6PEX.

Sheffield (SARS)—First and second Monday in month, 8pm. Firth Park Pavilion. Third Monday in the month, 8pm. Sheaf House Hotel, Bramell Lane, Sheffield. Sec G8VQS, tel 0246 31696. The club is now running two extra meetings per month at an ideal QTH. Talk-in for those who require it on S22.

Spen Valley (SVARS)—Thursdays, 14 April ("Police communications", by G6GMO), 28 April (Police communications visit), 12 May (Committee/project night), 8pm. Old Bank Working Men's Club, Mirfield, W Yorks. Sec G4MLW.

UK FM Group Northern—3 April, 1 May, 7.30pm. The Royal Hotel, Church Street, Barnsley. Sec G4LUE.

Wakefield (NWRC)—Thursdays, 14 April ("RSGB", by G4DAX, RR2), 7.45pm. Carr Gate Working Man's Club, Wakefield. Sec G6ELE.

York (YARS)—Fridays, 7.30pm. United Services Club, Micklegate, York. Sec Keith Cass, G3WVO. A recent demo of a computer impressed most members, particularly a cw program.

REGION 3—RR L. W. Craven, G4EQI, "Grass Moor", Radford Road, Alvechurch, Birmingham B48 7DT. Tel 021-445 1347.

Birmingham (Midland ARS)—19 April (Discussion on rally organization), 7.30pm. 294a Broad Street, Birmingham B1 2DS. Sec G8BHE, tel 021-422 9787.

Birmingham (South Birmingham RS)—6 April (Equipment demonstration by local trader, Ray, G4FSK), 7.45pm. Hamstead House, Fairfax Road, West Heath, Birmingham B31. Sec G8RGQ, tel 021-459 8312.

Coventry (CTARS)—25 April ("Aurora", by G8MFP), 7.30pm. Winfray Annexe of Coventry Technical College. Sec G8MFP, tel 0203 542877.

Droitwich (DARC)—Newly formed and RSGB affiliated amateur radio club. First Monday in each month, 8.30pm. Scout Headquarters, Station Road, Droitwich. Sec G4HFP, tel Stourport (02993) 3818.

Malvern Hills (MHRAC)—12 April (Film on cmos devices), 8pm. The Red Lion Inn, St Ann's Road, Malvern. Sec G4GFX, tel Malvern (06485) 62900.

Redditch (RRC)—14 April ("Demonstration of fast scan tv", by Peter Ward, G4GYI), 8pm. WRVS Centre, Ludlow Road, Redditch. Sec G3EVT, tel Alcester (0789) 762041.

Shrewsbury (Salop ARS)—14 April (Annual constructional competition), 8pm. Albert Hotel, Smithfield Road, Shrewsbury. Sec G3UQH, tel Shrewsbury (0743) 83375.

Solihull (SARS)—19 April ("TVI/BCI", by Fred Ward, G2CVV), 7.30pm. The Manor House, High Street, Solihull. For details contact sec G4AXW, tel 021-742 3972.

Stratford-upon-Avon (S-upon-A&DARC)—14

April (Quiz, "So you think you could still pass the RAE?"), 25 April (Advice on setting up an amateur radio station for the first time), 7.30pm. Talk-in on S22. The Control Tower, Bearley Radio Station, Nr Stratford. Programme sec G6CWK, tel Stratford (0789) 68863.

Sutton Coldfield (SCARS)—11 April (Natternight), 25 April (Spring clean surplus sale), 7.30pm. Central Library, Sutton Coldfield. Sec G8TUR, tel 021-353 2061.

Telford (T&DARS)—6 April ((AGM), 13 April (VHF NFD discussion), 7.30pm. Phoenix Centre, Webb Crescent, Dawley. Sec G8UGL, tel Telford (0952) 584173.

Walsall (WARC)—13 April ("Technical aspects of hospital radio systems", by G6HPE), 4 May ("RAE revision and test evening for exam on 9 May", by G4FAJ), 11 May (AGM), 8pm. Forest Community Centre, Hawbush Road, Leamore, Bloxwich. Sec G4GKC, tel Walsall (0922) 31675.

Warwick (Mid-Warwickshire ARS)—5 April (Visit to Mercia Sound), 19 April ("Electronics in medicine", by Area Health Authority Speaker), 3 May ("Seeing is believing"—demonstration of spectrum analyser, by Chris Reed, G8MFP), 8pm. 61 Emscote Road, Warwick. Sec Mrs Finnis, G6LKP, tel Southam (092681) 4765.

Worcester (W&DARC)—11 April ((One week later than usual) construction contest), 25 April (Informal evening), 8pm. The Old Pheasant Inn, New Street, Worcester. Sec G4NRD, Tel Evesham (0386) 41508.

REGION 4—RR M. Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. Tel Derby (0332) 556875.

Bolsover (BARS)—20 April ("Home construction", a talk by Rev George Dobbs, G3RJV, and annual construction contest), 8pm. Angel Hotel, Bolsover. Sec David Brocklehurst, G8KIF, tel Chesterfield 811666.

Buxton (BARS)—12 April ("The GB3HH repeater", by G3RKL), 7.30pm. Egerton Hotel, 36 St Johns Road, Buxton. Sec G4IHO, tel 0298 5006.

Derby (D&DARS)—6 April (Bring & buy sale), 13 April (Mark your rig night), 20 April (Visit by Everts Communications Ltd), 27 April ("Energy and nuclear power", a talk by the CEGB), 7.30pm. 119 Green Lane, Derby. Sec Jenny Shardlow, G4EYM, tel Derby 556875.

Grimsby (GARS)—7 April ("Valves", by G3ELZ), 21 April (TBA), 7.30pm. Cromwell Social Club, Cromwell Road, Grimsby. Sec Reg Scarlett, G3HZF.

Grantham (GRC)—19 April (TBA), 8pm. Shirley Croft Hotel, Harrowby Road, Grantham. Sec John Kirton, G8WWJ, tel Grantham 5743.

Lincoln (LSWC)—13 April ("Contest preparation and operation", by G8ZHP), 27 April ("RSGB and its services for amateurs", by Martin Shardlow, G3SZJ), 8pm. City Engineers Club, Water Side South, Lincoln. Sec Pam Rose, G8VRJ, tel Gainsborough 788356.

Loughborough (LFARC)—1 April (Open forum), 8 April (WAB, G4IAQ/G4IAQ), 15 April ("Video", by G4KGG), 22 April (Open night), 29 April (144MHz df, 8pm prompt), 8.30pm. Brush Sports & Social Club, Fennel Street, Loughborough. Sec Peter Crooks, G4KGG, tel Loughborough 268561.

Melton Mowbray (MMARS)—15 April ("Amateur satellites", by G4CUO), 7.30pm. St John Ambulance HQ, Asfordby Hill, Melton Mowbray. Sec Richard Winters, G3NVK, tel Melton Mowbray 63369.

Newark (N&DARS)—5 May (Auction sale), 7.30pm. Palace Theatre, Appleton Gate, Newark. Sec Roger Hiscock, G4MDV.

Nottingham (ARCON)—7 April (AGM), 14 April (Andorra revisited), 21 April (Activity night), 28 April ("Antenna erection", by G3TBY), 7.30pm. Woodthorpe House, Mansfield Road, Nottingham. Sec Paul Chapman, G4IJL, tel Nottingham 623828.

Spalding (S&DARC)—8 April ("Slow scan television", by John Stace, G3CCH). White Hart, Market Place, Spalding. Sec Ian Buffham, G3TMA, tel Spalding 3845.

REGION 5—RR J. S. Allen, G3DOT, 77 Rosslyn Crescent, Luton LU3 2AT. Tel 0582 508515, or at work, 0582 21151, ext 200.

Bedford (B&DARC)—Wednesdays, 6 April (Talk by the RSGB Regional Rep), 8pm. The Club House, Ravensden, Bedford. Sec J. Ferguson, G6JJT.

Cambridge (C&DARC)—1 April (College closed for Easter so pub night), 8 April (Grand junk sale at Comberton Village Hall), 15 April (144MHz fox hunt, only (alleged) humans and mobile radios involved), 22 April (An evening with John Hall, G3WLD (possible free after-shave!)). Coleridge Community College, Radegund Road, Cambridge. Club press officer D. Leary, G8JKV, tel Swavesey 31120.

Leighton Linslade (LLRC)—9, 10 April (Club entry in the BARTG spring rtty contest), 11 April, 24 April (DF hunt, number 6), 25 April (A "wash-up" on the df hunt), 7pm. Van Dyke Community Centre, Room A64, Vandyke Road, Leighton Buzzard. Sec P. Brazier, G6JFN, tel Heath & Reach 270.

Northampton (NRC)—7 April (The constructors' contest winner's talk), 21 April ("Microprocessor hardware", by G4MZX), 8pm. Kingsthorpe Community Centre. Sec G3VMU, tel Northampton 28516.

Shefford (S&DARS)—7 April (A night on the air), 14 April ("The London Marathon", by G4MEO), 21 April (Another talk by Claude, G2DPQ), 8pm. Church Hall, Shefford. Sec Brian Elliot, G4MEO.

Wellingborough (Nene Valley RC)—20 April (Second in series of lectures on the use and application of lasers), 8pm. The Royal, Knox Road, Wellingborough. Sec L. Parker, tel Wellingborough 79539.

RR5 apologizes if clubs have been left out this month, but two weeks before going to press he was asked to go to Korea and the Middle East. He may be away for the May deadline, so suggests that club secs make use of the RSGB news service. *G3DOT.*

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HA3 7EA. Tel Penn (049481) 4240.

Aylesbury Vale (AVRS)—April (Surplus equipment sale, auctioneer George Lacey), 8pm. Stone Village Hall, nr Aylesbury. Details from sec Cathy Clark, tel 0844 51461.

Chesham (C&DARS)—G3CLJ was re-elected chairman for the coming year. Details of meetings from sec J. Alldridge, G6LKS, tel Chesham 786935.

Harwell (HARS)—19 April (A talk on recording techniques by a guest speaker). Forthcoming activities during the coming month will include a df hunt on 144MHz and a social evening ten pin bowling. Further information from area rep Cliff Sharpe, G2HIF, tel Wantage 3496.

Milton Keynes (MK&DRS)—11 April (Basic construction), 8pm. Lovat Hall, Silver Street, Newport Pagnell, Bucks. Sec A. R. W. Date, RS48849, tel Bedford 711950.

Reading (R&DRS)—12 April ("The workings of the VHF Contests Committee", by Cliff Sharpe, G2HIF, who will discuss possible radical changes to vhf contests), 26 April (Demonstration by South Midlands Communications), 8pm. The Club Room, The White Horse, Peppard Road, Emmer Green, Reading, Berks. Sec Chris Young, G4CCC.

Slough (Burnham Beeches RC) (S&BBRC)—Meets first and third Monday in each month, 8pm. St John's Ambulance HQ, Burlington Avenue, Slough. Sec A. E. Alderman, G3LQD.

Vale of the White Horse (VWHARS)—5 April (Junk sale), 3 May (Dave, G3BLS, on morse). Details from sec Ian White, tel 0235 31559.

REGION 7—RR to be appointed

Ashford (Echelford ARC)—11 April (AGM plus a video showing), 28 April (Bring & buy sale), 8pm. The Hall, St Martin's Court, Kingston Crescent, Ashford, Middlesex. Sec Anton Matthews, G3VFB, tel 01-892 2229.

Bexleyheath (North Kent RS)—First and third Tuesday in each month, 19 April (AGM), 3 May (CEGB videotape about Sizewell nuclear power station), 8pm. The Pop-In Parlour, Graham Road, Bexleyheath. Sec Pelham Conduit, G4KCZ.

Biggin Hill (BHARS)—Last Tuesday in each month, 19 April (Construction evening with Ian Daniels), 10 May (Visit to Kent police HQ), 8pm. Biggin Hill Memorial Library. Sec Ian Mitchell, G4NSD, tel Biggin Hill 75785.

Croydon (Surrey Radio Contact Club)—First and third Mondays in each month, 11 April (AGM), 25 April (RAE revision session). Please note that the dates in April and May are second and fourth Mondays to avoid clashing with the bank holidays. 8pm. TS Terra Nova, 34 The Waldrons, Croydon. Sec Ray Howells, G4FFY, tel 01-642 9871.

Guildford (G&DRS)—Second and fourth Friday in each month, 22 April (AGM), 8pm. Model Engineers HQ, Stoke Park, Guildford. Sec Helen Mullenger, G4OJO, tel Aldershot 20384.

Redhill (Reigate ATS)—19 April (AGM), 8pm. Constitutional & Conservative Club, Warwick Road, Redhill. Sec Chris Barnes, G8FEE, 25 Hartswood Avenue, Reigate RH2 8ET.

Thames Ditton (Thames Valley ARTS)—5 April (Caernarvon Trophy), 3 May (NFD briefing and talk by Bill Hall, G4FRN, on maritime mobile net operation), 8pm. Thames Ditton Library, Watts Road, Giggs Hill, Thames Ditton. Sec Julian Axe, G3EHN, tel 01-946 5669.

Wimbledon (W&DRS)—8 April (Morse practice), 29 April (Workshop fault-finding evening for those projects or pieces of equipment that just will not work), 8pm. St John Ambulance Hall, 124 Kingston Road, Wimbledon SW19. Sec Geoff Mellett, G4MVS, tel 01-644 8249.

I am reluctantly retiring as RR7 due to increasing business commitments. My sincere thanks to everyone for their help and encouragement during my time in the job. *G8HMG.*

REGION 8—RR K. A. Crouch, G8KEN, 14 Victoria Road, Capel-le-Ferne, Folkestone, Kent CT18 7LR. Tel 0303 55241.

Canterbury (EKRS)—7 April (G8GHH giving a talk which is a mystery!), 21 April (Visit to brewery when it is hoped samples will be given), 7.30 for 8pm. The Cabin, Kings Road, Herne Bay. Details from Stuart, G6LZG.

Canterbury (UoKARS)—Mondays, 7.30pm. Radio Shack, behind Maintenance Buildings, off Giles Lane. Talk-in on S15. Meetings consist of cw practice and then drink and chat. Details from G6FRX.

Chichester (C&DARC)—5 April (Club meeting), 21 April (AGM, please will all members attend), 7.30pm. Green Room, Fernleigh Centre, 40 North Street, Chichester. Details from G4ETU, tel West Ashling 463.

Crawley (CARC)—27 April (Junk sale. Note early start at 7pm). Trinity United Reformed Church Hall, Ifield Drive, Crawley. David, G4IQM, tel Crawley 882641, has details of club and of informal meetings at members' houses on alternate Wednesdays.

Dartford (DDFC)—6 April (Malt Shovel PH), 10 April (DF hunt). Details from Steve, G4NKM, at Malt Shovel PH, Dartford.

Dover (SEKYMCA ARC)—Wednesdays, 6 April (AGM and presentation of awards, will all members please try to be in attendance), 7.30pm. YMCA, Dover. Talk-in on S20 or R4.

Eastbourne (Southdown ARS)—First Monday in each month, 11 April (Ron Lobeck, the TVS weatherman). Chaseley Home, South Cliff, Eastbourne. Contact Tom, G4MVN, or Peter, G8IQO, tel 763123.

Hastings (HERC)—20 April (Junk auction), 8pm. First, second and fifth Wednesday (Micro nights), Ashdown Farm Centre. Basic language computer course on same evenings. Third Wednesdays (Main meetings), West Hill Community Centre. Details from Alan Beecher, G8VEM, tel Hastings 216516.

Horsham (HARC)—7 April (Spring junk sale, all visitors welcome), 5 May (HARC construction contest), 8pm. Guide HQ, Denne Road, Horsham. Details from Tony Wadsworth, G3NPF.

Medway (MARTS)—Fridays (except Good Friday), 8 April (ARRL film "This is ham radio"), 22 April ("Computers in amateur radio", by G8XLH). Details from Peter, G4EVY, the new sec.

Swale (SARC)—Mondays, 18 April ("Resuscitation", by Phil Crowder), 7.30pm. A cw course is planned for Thursdays and RAE lessons on Fridays. Anyone interested please turn up before 11 April at Nina's Restaurant, 43 High Street, Sittingbourne, at 7.30pm on club nights. Sec Brian Hancock, G4NPM.

Thanet (RCT)—8 April ("Propagation", by G3MDO), 22 April ("VHF contest operating", by G4DCV). Birchington Village Centre. Details from Ken, G4PTE, tel Thanet 32198.

Tunbridge Wells (WKRS)—29 April (AGM, will members please try and make this a full and constructive meeting). Adult Education Centre, Monson Road. Informals held alternate Tuesdays. Drill Hall, Victoria Road. Contact Brian, G4DYF. Club nets held Sundays: ssb, 28·7MHz, 1100h; cw, 1000h, 3·51MHz. Mondays: vhf, 2000h, S23, 145·575MHz.

Worthing (W&DARC)—5 April (Alan, G3VZJ, on Amtor), 12 and 19 April (Visit to telephone museum), 26 April (Spring junk sale), 7.30 for 8pm. Pond Lane Amenity Centre, Worthing. Details from Joyce Lillywhite, tel Worthing 63062, after 6pm.

REGION 9—RR W. J. Colclough, G3XC, Highview, Indian Queens, St Columb, Cornwall TR9 6LL. Tel 0726 860485.

Camborne (CRAC)—7 April (AGM), 15 May ("Test equipment and how to use it", by G3OCB, G3VWK, and G3XFL. Bring your vhf rig for checking (does it really transmit on all bands at once? *G4PEM*)), 7.30pm. SWEB Club room, Pool, Camborne. New callsigns at the club: G6EGS, now G4RVP; G8SLR, now G4RRQ; and G8MXN, now G4RXZ. Congratulations to all. Details from sec Simon Rodda, G4PEM, QTHR as G6DFE.

Exeter (EARS)—April (Visit to IBA station at Seaton), 7.30pm. Community Centre, St Davids Hill, Exeter. First and third Mondays (Informal). The Scout

RSGB representatives and Society workers gathered at the Region 9 meeting held at Plymouth on 30 January. L to r: G2ABC, news reader; G3ZYY, news reader; G5HD, Zone D manager; G4LST, North Devon RC; G3LSD, news reader; G8JML, AR West Cornwall; G8XIP, AR, East Devon; G8TEE and G8NAU, Plymouth Poly; G3RSJ, Exeter RS; G4JYF, Raynet and ECC RC; G8PLP, Exeter; G3PVB, news reader; G3XC, representative for Region 9; and G4CG, AR North Devon

Hut, Emmanuel Road, Exeter. Contact pro Andy Lake, G8YOA, tel 0392 39597.

Exmouth (EARC)—Alternate Wednesdays, 7.30pm. 6th Exmouth Scout Hut, Marpool Hill, Exmouth, Devon. Chairman, Alec Atkins, G3RRK; sec, Hugh Edwards, G4RUT; treasurer, Steve Gurney, G8UXJ; Club callsign G4HOB. Details from sec Hugh Edwards, G4RUT, tel Exmouth 73157.

Plymouth (PRC)—4 April (Fox hunt), 18 April (AGM), 7.30pm. Tamar School, Paradise Road, Millbridge, Plymouth. The club rally will be held on 29 May, usual venue (club hq), commencing at 1000h. Talk-in on S22, further details from Ian McAulay, G6CZM. Club details from sec Peter Connor, G8XTE, tel 0755 37319.

St Ives (County Secondary School RS) (G4DWB)—Higher Tregenna, St Ives, Cornwall. A note and sae to the above address will bring in return all information and up-date details of the school repeater, GB3SI.

Torbay (TARS)—30 April (AGM), 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay. Club rally 28 August, venue to be advised but expected to be as last few years, ITT Paignton. Details from Mrs Rider, 7 Kingston Close, Kingskerswell, tel 0804 75130.

Treverbyn (English China Clay RC)—Mondays. The Club Room, Treverbyn. Chairman, Maurice Richards, G3WKF; vice-chairman, Chris Rodgers, G4MXB; sec, Mike Porter, G4OKS; treasurer, Tony Turner, G6EKZ; PRO Jack Redfearn, G8HSZ. Net Fridays, S22, 7 to 7.30pm. Net Sundays, 3·69MHz ± QRM, about 11pm (time supplied by pro). Those members wishing morse practice should tune in to G4HTD on S22, Tuesday, Wednesday, and Thursdays at 1930h.

REGION 10—RR to be appointed.

Mr Philip Jones, the representative for Region 10, has resigned for personal reasons.

Any affiliated clubs or groups in the region who would like to have an entry in "Club News" should send it direct to the editor until a new regional representative is elected.

Cardiff (CRSGBG)—11 April ("Raynet—the Cardiff scene), 7.30pm. Pantmawr Hotel, Tyla Teg, Pantmawr Estate, Whitchurch, Cardiff. Details from sec C. Laws, tel Crowbridge 3212.

Llandaff (LCARC)—Tuesdays, 7pm. Lecture Room A208, Electronics lab. Non-student members also welcome. The college runs an RAE and is open to suggestions for morse classes, practical classes, lectures etc. The shack is fully equipped for 144MHz. Details from GW6CUR, 301 Newport Road, Roath, Cardiff CF2 1RD.

Pembroke (PRSGBG)—29 April (Slide show and talk on Tristan da Cunha, by GW3SWQ). The Defensible Barracks, Pembroke Dock. Details from M. A. Shelley, GW3XJQ, tel Pendine (09945) 267.

Pontypool (PARS)—Tuesdays, 7pm. The Educational Settlement, Rockhill Road, Pontypool, Gwent. Club activities include RAE classes, morse tuition, and operation of the club's hf shack. Details from G. A. Smith, GW6JRB, 34 Glen View Road, Trevethin, Pontypool, Gwent NP4 8ED.

REGION 11—RR B. H. Green, GW2FLZ, 1 Clwyd Court, Tan-y-Bryn Road, Colwyn Bay, Clwyd LL28 4AH. Tel 0492 49288.

Anglesey (ARG)—5 April (Talk by John Fielden, GW4NAH), 19 April ("Amateur operating procedure"), 7pm. Primary School, Benllech, Anglesey. Sec Mr C. Williams, GW6DOK, tel Gaerwen 603.

Colwyn Bay (Conwy Valley ARC) (GW6TM)—Special meeting on 10 April (Visit by Amateur Radio Exchange with a comprehensive range of equipment), 2.45pm. 14 April (Talk by Mr J. E. T. Lawrence, "Computers and amateur radio"), 7.30pm. Green Lawns Hotel, Bay View Road, Colwyn Bay. Sec Mr J. N. Wright, GW4KGI, 46 The Dale, Woodlands, Abergele, Clwyd LL22 7DS, tel 0745 823674.

Dolgellau (Meirion ARS) (GW4LZP)—7 April (AGM), 7.30pm. Nannau Country Club, Llanfachreth. Sec Mr Bob Halhead, GW3KOR.

Rhyl (R&DARC)—14 April (Activity night, callsign GW4ARC), 28 April (Talk by Gordon Adams, G4LEQ, "Propagation of radio waves"), 7.30pm. The First Rhyl Scout HQ, Tynewydd Road, Rhyl. Sec Mr B. Jones, 6 Rhodfa Maes Hir, Rhyl, tel 0745 37284.

REGION 13—RR A. B. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. Tel Kirkcaldy (0592) 200335.

Would secs please check if club details listed below are correct in the January issue, and if not please contact me. *RR13.*

Berwick-upon-Tweed (Borders ARS)—GM3YPI, tel Eyemouth 50492.

Dalgety Bay (Marconi Space & Defence Systems ARC)—GM4HBG, tel Glenrothes 771057.

Dunfermline (DARS)—GM8IID, tel Dunfermline 728778.

Edinburgh (E&DARC) (GM4HAM)—GM3RFQ.

Edinburgh (Ferranti Recreation Club ARS) (GM4FER)—GM8JKG, tel 031-441 5684.

Edinburgh (GB3ED Repeater Group)—GM3GBX, tel 031-447 2611.

Edinburgh (Heriot Watt University ARC) (GM3WEE)—GM4JFS, tel 031-339 1104.

Edinburgh (Leith Nautical College AR&EC) (GM4AXG)—GM4FKF.

Edinburgh (Lothian RS) (GM3HAM)—14 April (Operational night hf), 28 April (DF hunt preparation/constructional contest), 12 May (Operational night vhf), 26 May (DF hunt, Braid Hills). Contact GM6JAG, tel 031-664 5403.

Glenrothes (G&DARC) (GM4GRC)—GM8ZTV, tel Kirkcaldy 203582.

Kelso (KARS) (GM4KHS)—Mondays, 7-30pm. Abbey Row Community Centre. GM6FEA, tel Kelso 24654.

Lothians Raynet Group—GM3OWU.

Scottish Borders Repeater Group—GM4BDJ.

St Andrews (UoStAR&ES) (GM4BGA)—GM4JWV, tel St Andrews 74507.

REGION 16—RR T. D. Howe, G3PLF, 18 Vange Hill Drive, Basildon, Essex SS16 4DD. Tel 0268 24453.

Canvey Island (South Essex ARS)—6 April (Practical evening), 13 April (Film show), 20 April (Discussion on summer weekend field days/contests), 27 April (Junk sale), 7.30pm. The Paddocks Community Centre, Long Road, Canvey Island. Details from G6BYH, tel Canvey Island 683526.

Colchester (CRA)—21 April ("Design and production of printed circuit boards", by Bev Clues), 7.30pm. Colchester Institute, Sheepen Road. Details from Frank Howe, G3FIJ, tel Colchester 70189.

Ipswich (IRC)—6 April (Ipswich UHF Repeater Group open meeting), 13 April ("Ignition interference suppression", by G4GVW), 27 April (AGM), 8pm. Club Room, Rose & Crown, Norwich Road. Details from Jack Tootill, G4IFF, tel Ipswich 44047.

Norwich (Norfolk ARC)—6 April (AGM), 13 April (Short meeting), 20 April (Visit to Anglia TV), 27 April (Short meeting), 7.45pm. Crome Community Centre, Telegraph Hill East. Details from Paul Gunther, G8XBT, tel Norwich 610247.

Vange (VARS)—7 April (Junk sale), 7.30pm. Main Hall, Barstable Tenants Community Association, Long Riding, Basildon. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. Tel Ferndown (0202) 876018.

Basingstoke (BARC)—12 April (Talk by the staff of *Practical Wireless*), 7.30pm. Second Tuesday in each month, British Legion Hall, Crown Lane, Old Basing, Basingstoke, Sec G6KVN, tel Tadley (07356) 3004.

Bournemouth (BARS)—1 April (Junk sale), 15 April ("AF transformer design", by Alan Dufall), 6 May ("Ordnance Survey maps", by G4ERO), 7.30pm. Kinson Community Centre, Kinson, Bournemouth. Sec G4EKE, tel Ferndown (0202) 877945.

Fareham (F&DARC)—Wednesdays, 6 April (RTTY), 20 April ("Making your own pcbs", by G4ITF), 7.30pm. Porchester Community Centre. Sec G4ITG, tel Fareham (0329) 234904.

Farnborough (F&DRS)—Second and fourth Wednesday in each month, 13 April (Bring and buy sale), 7.30pm. Railway Enthusiasts Club, Access Road, Farnborough. Sec G4BJQ, tel Farnborough (0252) 543036.

Gillingham (Blackmore Vale ARS)—12 April (AGM to be held at Hunters Lodge, Leigh Common, Near Wincanton. (on A303) at 8pm). Sec G3WRV.

Jersey (JAEC)—13 April ("VIC20 ZX Spectrum and Genie Disc system, demo by Brian Johnson, Mick Haigh and Phil Johnson), 8pm. The Communication Centre, St Brelade, Sec Mrs M. Smith, tel 0534 23248.

Poole (PARS)—The callsign G4PRS has been allocated to the society. Club officials are now as follows: president, G3BCI; sec, G3XYD; treasurer, G3ZPR. 7.30pm. Poole Technical College, North Road, Poole. For dates contact sec on Poole (0202) 671562.

Salisbury (SR&ES)—Tuesdays, 7.30pm. Grosvenor House, Churchfields Road. Sec G2FIX, tel Salisbury (0722) 743837.

Weymouth (SDRS)—5 April (AGM), 7.30pm. Army Bridging Camp, Wyke Regis, Weymouth. Sec G3ZGP, tel Weymouth (0305) 812893.

Wimborne (FRARS)—The callsign G6FFR has been allocated to the society. 10 April (Talk and slides on the elements of radar, by G2KV), 17 April (Talk by G8MCO), 24 April (First anniversary open evening), every Sunday, 7.30pm. Flight Refuelling Social Club, Merley, Wimborne. Sec G8VFY, tel Wimborne (0202) 882271.

REGION 19—RR R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ. Tel 01-989 6741.

Cheshunt (C&DARC)—6 April ("The BBC micro and ar", by G3TIK), 13 April (Natter), 20 April (Member's shacks, a slide show, by G8LNM), 27 April (Natter), 8.15pm. The Church Room, Church Lane, Wormley, nr Cheshunt, Herts. Details from Roger Frisby, G4OAA, tel 09924 64795.

Chingford (Silverthorn ARC)—The club is holding an Easter Camp between 1 and 4 April. All members will be welcome. Details from sec Chris Hoare, G4AJA, tel 01-529 2282.

Chiswick (ABCARC)—19 April (Discussion on members' problems), 7.30pm. The Committee Room, Chiswick Town Hall, High Road, London W4. Sec W. G. Dyer, G3GEH, tel 01-992 3778.

Ealing (E&DARS)—Tuesdays, 8pm. Hanwell Community Centre, Room 5, First Floor, Westcott Crescent, Hanwell W7. Information on the new club premises (temporary) from B. Greenaway, G3THQ, tel 01-450 8259.

Edgware (EDRS)—14 April (Visit to Lowe Electronics at Kings Cross. (Members only)), 28 April (Informal and tech topics). The Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Sec Howard Drury, G4HMD, tel 01-952 6462.

Grafton (GARS)—8 April ("The truth about amateur radio", a video show by G3MCD), 22 April ("Historical and physiological apparatus and research", by Prof Audley of UCL), 8pm. Five Bells Pub, East End Road, East Finchley, London N5. Sec Jim Chambers, G4IBK, tel 01-346 5841.

Harrow (RSH)—1 April (No meeting), 8 April (Informal and beginners' df evening), 15 April (Demo of colour sstv), 22 April (Talk on dxing by G2TA), 29 April (Computer games evening), 7.30 for 8pm. Roxeth Room, Harrow Arts Centre, (opposite the Alma Pub), High Road, Harrow Weald, Middx. Come up on GB3HR for instant talk-in to the premises on club night. Details from Chris Friel, G4AUF, tel 01-868 5002.

Basingstoke ARC celebrated its 21st birthday by holding a dinner, and operating a special event station, GB2XXI. The first 21 stations to send in QSLs got a piece of the birthday cake which chairman, G6BBW, is cutting in the photograph

Havering (H&DARC)—6 April (Informal), 13 April ("A staircase for the shack", by G3KFW), 20 April (Informal), 27 April ("ICs for radio comms", by G3RZP of Plessey Semiconductors Ltd), 8pm. Fairkytes Art Centre, Billet Lane, Hornchurch, Essex. Details from A. Negus, G8DQJ, tel Upminster 24059.

London (Central POHQARS)—This group has started a 3·5MHz net which is open to all BT employees and other Post Office and PTT employees in other countries. Listen out on Wednesdays, 2000h local time in UK on 3,750kHz. Net controller G3BYW. Details from J. A. Clarke, G3TIS.

St Albans (Verulam ARC)—26 April (Talk on propagation by Charlie Newton, G2FKX), 7.45 for 8pm. RAFA Club. Details from Ed Bailey, G4KLQ, tel St Albans 58132.

Southgate (SARC)—14 April (Junk sale), 7.30 for 8pm. St Thomas's Church Hall, Prince George Avenue, Oakwood, London N14. Publicity sec G8EWG.

Stevenage (S&DARC)—All meetings are now held at "TS Andromeda", Shephall View, Stevenage, Herts. Morse classes at 7.30pm. Meetings at 8pm. 1 April (To be announced), 10 April (144MHz fm contest). Details from Terry Bailey, tel 0438 62860.

South West Herts UHF Group—This group's 10GHz beacon will be back on the air on 22 April. They would like some interested people to help maintain it, especially with cash assistance. If you can help contact Peter, G3YXZ, 29 Standfield, Abbots Langley, Watford.

Wanstead (ELGRSGB)—17 April (A discussion on cable tv. A qualified expert on the subject will be present). Wanstead House, The Green, Wanstead, London E11. Details from G6DXW, tel 01-550 7013.

REGION 20—RR B. L. Goddard, G4FRG, 2 Greenfield Park, Portishead, Bristol BS20 8NQ. Tel 0272 848140

Bath (B&DARC)—Welcome to this newly affiliated club. Alternate Wednesdays, 6 April (AGM), members are requested to be present, 7.30pm. Englishcombe Inn, Englishcombe Lane, Bath. Details from Colin Rose, G8YCV, Westfield Orchard, 10 Englishcombe Lane, Bath, tel Bath 311687.

Bristol (BARC)—3 April (BARC Easter Activity Contest—details of this event from G6AUR, QTHR), 5 April (Quarterly business meeting and a debate on "contests and how to win 'em"), 12 April (Devoted to helping with the club projects), 19 April (Bob England, G4REH, will be giving a demonstration on rtty), 26 April (Computer club and general meeting), 3 May (A night on the air, hf and vhf with the club callsign G3TAD to look for), 7.30pm. YMCA, Park Road, Kingswood, Bristol. The club now has a net on top band, 1·919MHz, every Sunday, 1100h. Further information from Trevor Cockram, G8GFZ, or Mark Goodfellow, G4KUQ.

Bristol (BRSGBG)—25 April (Tom Douglas, G3BA will be talking about "A radio amateur and his radio work in a Japanese prisoner of war camp"), 7.30pm. Queens Building, University Walk, Bristol University. Details from Chris Short, G8GLQ, tel 0272 621253.

Bristol (NRARC)—Fridays, 7.30pm. Self Help Enterprise, Braemar Crescent, Northville, Bristol. On 29 April there will be a demonstration of rtty which includes a computerised transceiver. Details from Ted Bidmead, G4EUV, tel 0272 691685.

Cheltenham (CARA)—Please note that CARA now meets in the Stanton Room, The Branch Library, Charlton Kings, and meetings are normally held on the first and third Fridays in each month, 7.30pm. (Just to confuse you for April, because of the holiday arrangements, the meetings will be on the second and fourth Fridays, ie 8 and 22 April). The new branch library lies behind the church, between Church Street and Horsefair Street. There is a car park beside the library. Details from Gill Harmsworth, G6COH, tel Cheltenham 25162.

Gloucester (GARS)—Wednesdays, 6 April ("Construction contest), 13, 27 April (No meetings), 4 May (Brian Goddard, G4FRG, RR20, will be visiting the club), 7.30pm. St Barnabas Church Hall, Stroud Road, Gloucester. Details from Tony Martin, G4HBV.

Portishead (Gordano ARG)—27 April (AGM, all members are requested to attend), 7.30pm. Ship Hotel, Down Road, Portishead. Details from Bob Coles, G8ROC, tel 0272 691685.

Thornbury (T&DARC)—6 April (Talk on rtty), 7.30pm. White Horse, Groves End on the A38. Details from Alan Jones, G8AZT, tel Thornbury 416381.

Yeovil (YARC)—Please note that the new venue for meetings is the Milford Recreation Centre, Milford Park, Yeovil. 7 April ("The half wave dipole", by G3KSK), 14 April ("An idea about aerial height", by G3MYM), 21 April ("A home-built delta loop", by BRS52181), 28 April (Natter night), 7.30pm. Details from Adrian Dening, G4JBH, tel 0935 23873.

MEMBERS' ADS

CONDITIONS OF ACCEPTANCE

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB only. They must be submitted on the Members' Ad form printed on the back of a *recent* address label carrier used to mail *Rad Com* to the advertiser: this will automatically provide proof of membership and should not be more than two months old. No acknowledgement of receipt will be sent, and advertisements not clearly worded or punctuated, or which do not comply with the conditions of acceptance, will be returned. No correspondence concerning this service will be entered into.

Trade or business advertisements, even from members, will not be accepted for "Members' Ads" but should be submitted as classified or display advertisements in the usual way. Traders who are members must enclose a signed declaration that the items for sale or wanted are part of, or intended for, their own personal amateur station.

The RSGB reserves the right to refuse advertisements, and accepts no responsibility for errors or omissions, or for the quality of goods offered for sale. Advertisements for citizens band equipment will not be accepted.

Warning. Members are advised that they should, as far as possible, ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The "purchase" of goods legally owned by a finance company could result in the "purchaser" losing both the goods and the cash paid.

The current rate is £1 for 40 words or less: advertisements containing more than 40 words will cost an additional £1 for every additional 40 or less words. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to Radio Society of Great Britain.

Closing dates in 1983 for issues in brackets, are **20 April** (June): **18 May** (July); **16 June** (August); **14 July** (September); **24 August** (October); **22 September** (November); **20 October** (December); **17 November** (January); **15 December** (February).

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD, CHELMSFORD, ESSEX CM1 1SS
Do not post to RSGB HQ or Advertising officer.

FOR SALE

Yaesu FT-ONE, all options fitted, as new, unable to exploit this excellent rig due to severe restrictions with antennas and local planning, £1,050 incl Securicor. No offers. G4RYO NOT QTHR. Tel Kingsbridge (Devon) 6331, evenings only please.

QQVO750 2m linear, £20. 160 magazines, *Radio Communication, SWM, Practical Wireless* etc, £8. Philips 22in colour tv, vgc, ok for video etc, £55. Sound City 120 amp and spkrs, £95. Approx 200 valves, old, new, offers. Tel Dave, 01-360 0210.

Have lots of vacuum tubes, second world war to present, manuals, send me your needs. *Wanted:* British/German second world war military radios and manuals, W.H.Y? I buy or swap. Serious collectors only. Tony Grogan, WA4MRR, 5 Rollingwood Drive, Taylors, SC 29687, USA.

FRG7, rx, handbook, boxed, ultra loop UL1000, MM144/28-30 converter, all good cond, owner gone G6, first £110 takes the lot. G6UAN NOT QTHR. Tel 0625 616542.

Canon A1, f1.4 lens, motor drive (ma set), Tamron SP35-80, f2.8 zoom, Speedlight 199A, all in alloy case, many accessories, will sell or preferably exchange for high quality hf or vhf equipment. Anything considered. G6AGV, QTHR. Tel Whitstable (0227) 273660 after 6pm.

Due to the death of G4AGF the following items are for sale: FRG7 rx, good cond, £110. Yaesu FLDX400 hf tx, £120. Reace SWR3 bridge, £10. Two sets headphones, offers. Tel Blandford (0258) 55995.

FT221RD, matching spkr, £300. TR2400 2m handheld tx/rx, charger, £135. DX100L gen cov rx, £40. All in mint cond, hardly used. Alan Morrison, G8KUJ. Tel 0902 755634.

Collins tx/rx, exc cond, FC902 atu, new. *Wanted:* Collins KWM380, in wkg order. G4OWC, QTHR. Tel Derby 557705.

PET Commodore computer model CBM4032, comp with Commodore tape cassette C2N, basic programmer's toolkit, arrow features, users manuals, PET/CBM personal computer guide, PET Basic, PET and the IEEE, 14 months old, used little, bargain, £400. G4BWU, QTHR. Tel 0438 54261.

Bargain—new Icom 720A and PS115, new FC902 atu, Collins KWM2, exc cond. *Wanted:* Collins linear amp, Drake L4B linear amp or Kenwood linear amp. Tel Derby 557705.

Sony ICF6800W communications rx, a.m. 0·530-30MHz, lsb/usb, cw, filters, fm 88-108MHz, mains/batt, manual, exc cond and performance, cost £416 new, for sale incl MMC435/600 amateur tv converter, 2m converter, high quality Yaesu YH55 headphones, £140. Rama digital frequency counter F50, 1kHz-54MHz, cost £40, unused, £20. Tel Bulls Green (Herts) 219.

Sommerkamp FLDX500 hf bands tx, 240W p.e.p., spare pas, good clean cond, £100. *Wanted:* TenTec Century 21 matching accessories, 277 ant tuner, 276

calibrator, 670 keyer. G3TSS, QTHR. Tel 043471 3125, after 6.30pm.

Yaesu FT101E, FR101D, offers please. *Wanted:* Gen cov scanner, preferably Bearcat, would consider faulty example; G4IZT, QTHR. Tel Leeds (0532) 675527.

Trio 7800 with extras, perfect, £150 ono. Trio 2300 with extras, perfect, £100 ono. G4HBD, QTHR. Tel 0202 767583.

144MHz tx/rx, FDK 750E, as new, £210. Four-el quad rotator, lower bearing, masts, brackets, cables, £35. AR240 handheld 144MHz synthesized tx/rx, nicads, case, mains, 12V chargers etc, £115. G8FBU NOT QTHR. Tel Richmond (N Yorks) (0748) 811812.

SX200 scanning rx, £150. Eddystone 770R, £40. FD50A brand new 5·25in floppy disc drives (two), full technical details, unused, in orig packing, £80 each. Tel Colin, 0276 27918, after 6.30pm.

TS700G 2m multimode, 240/12V, manual, 11 xtals covering 22 channels, will exchange for comparable hf rig, cash adjustment if necessary, will sell incl all xtals, £275. G3FRM, QTHR. Tel 0207 506280.

Two ex-service telephone sets type "F" Mk2, £20 both. Handbook SCR522/542 (US Army rt), £2. CCT Hallicrafter SX24, £1. Putting shot, £3. Air Ministry psu type 270 240V ac, 600V dc, 200mA, in beechwood box, £10. Joystick car top harness, £3. Collect/postage extra. Tel 0954 50597.

2 × 2m 10XY with phasing harness, £22 each. 2 × 70cm 12XY with phasing harness, £25 each. 12m 10Y long Yagi, £16. G6CYU, QTHR. Tel Horley 73902, evenings.

Marconi wavemeter, 20/300MHz TF643B 1/10/51 Mk3, £15. SSB Liner 2 preamp, wkg, £60. QVO640, £3.50. QVO320, £3.50. QVO26, £2.50. Yaesu FT200 tx/rx, wkg, £200. Buyer collects large items. G3FD. Tel Southend 554764.

FT221 all mode 2m, updated R model, absolutely mint, £295 ono. LM14(BC221), psu, calibration book, £15. 898 HRO Jacksons dials. Lambda variable 10-30V psu, several wide spaced capacitors, valves QQ to-6 to QQVO 3-10 etc. G2BUC, QTHR. Tel 0285 2349.

MMT432/144R, as new, vgc, £125. Philips tape recorder EL3302A/15P, mains psu, £12. Polar Elec Developments Ltd vswr bridge for vhf and uhf N-sockets, £40. Mobile mic MM202G for safe mobile op, £15. All plus postage, G8ESK, QTHR. Tel 0274 45611.

HQ1 minibeam, just 12 months old, perfect, £75. AR40 rotator, 30ft five-way cable, recent overhaul, £35. Both items, £100. Buyer collects. G3CPM, QTHR. Tel 0386 852753.

Heathkit HW101 ssb cw tx/rx, good cond, Shure 444 mic, swr meter, atu, psu, dummy load, spkr, key, tvi filter, £125. AR245, fully synthesized, 5W 2m tx/rx, charger, rubber ant, psu, £100. G4MYY. 58 Longfield, Falmouth, Cornwall TR11 4SL. Tel Falmouth 318802.

FT707S, no mods, as new, boxed, £350. CI110 120W hf linear amp, £60. FC707, as new, boxed, £50. G3GLL, QTHR.

FT277ZD (FT101ZD), all options, FV101Z vfo, £400 ono pair. MM 2m transverter, 2m 4CX250B amplifier, psu, two nine-el Tonnas, splitter, 4CX250 base, 4CX250 valves, many other goodies, offers. SAE for full list. G4IYA, QTHR. Tel Shorne 3172.

Museums: rare communications rx, "Radio Manufacturers Eng", Illinois, USA, model 69, 250V, 50C, label test/passed 1936 Dec, six bands, 0·5-32MHz band spread, all orig, matching spkr, very lively, set spare valves, 19 by 9 by 10in, £65 collected. BTH Phones 4000 (1934), £11. Top band valve tx, vfo controlled, psu, perfect, £25. Video monitor EG100, bw, cost £86, used three times, £60. G8ARV 2m tx, fm 1ch, £20. Carriage extra, G3VCJ, QTHR. Tel 042-43 4726.

Eddystone 770R, 19-165MHz, £90. Creed 7 teleprinter, silence cover, tuning fork, £20. MK Products rtty terminal unit, £40. Catronics teletext decoder, £45. Storno Viscount, near 4m control box, £20. Without control box, £5. Homebrew atu, £5. G4DAT. Tel Burnham (Bucks) 4749.

RTTY Creed 444 teleprinter, auto model, tape punch, reader, gears for 45, 50 and 75 bauds, full workshop manual, exc order, £55. Will deliver for cost of petrol. G3RDG, QTHR. Tel 01-455 8831.

FM base stations: cw psu, 170MHz solidstate, 6/40 pa, £18. UHF 480MHz, all solidstate, repeater control gear, £18. Easily converted to hambands. Two old Vanguard tx/rxs, start a junkbox! £6. Akai X5000W reel-to-reel recorder, £35. National Technics Dolby cassette deck, £15. Solidstate mixers: Millbank, £11; accoustic with reverb, equaliser, pa, £40. Various amplifiers, mixers, spkrs, power supplies, transformer, valves, coils, capacitors, pcbs. Come and rummage. Could deliver London-South Essex areas. G4NHU. Tel Upminster (Essex) 20949.

Creed S4 R0 teleprinter, integral ST5 tv, some spares, £25. *Wireless World* Dolby unit, calibration tape, cassette, £25. G8HHQ, QTHR. Tel Romsey 515581, or Winchester 822565 (office).

Pair 4CX250Bs spares, grid cavity blower etc, only needs anode lines for 2m linear, £35. Levell ac microvoltmeter TM3B, £50. Pye Bantam, nicads, £30. G4HUE, QTHR. Tel Andy, 01-554 0399.

R209 rx, 1-20MHz, a.m./cw/fm, 12V dc, exc cond, £40. Pye Vanguard fm/a.m. transistor rx, six channels, four fitted 20W tx output, £30. GM8BOV. Tel 031-331 2755.

Yaesu FT707 with FP707 power supply, hand mic, £450. G4DUM, QTHR. Tel Crayford 526460.

Yaesu FRG7 communication rx, exc cond, orig packing, comp with manual, perspex front cover, fitted protective cover, £110 ono. G5EFY NOT QTHR. Tel Coventry 411847.

TS520, fitted with YG 3395C cw filter, immac cond, £310. G3ION, QTHR. Tel Southampton (0703) 769706.

Antenna mast, SM30 Altron wall mounting, Stolle rotator, one year old, worth £300 new, £175. Heathkit 2m linear, 80W, £60. Preamps, W&D, 2m/70cm, boxed, £20. Have paperwork. G6ANT, QTHR. Tel 01-997 1416.

Amtor Mk1 self-powered, in case, all interfaces, £50. Microwave Modules transverter MMT144/28, £65. Amcomm FM1000 fm module for Trio R1000, £10. Hansen SWR25 power swr meter, £10. All items plus postage. G3RDG, QTHR. Tel 01-455 8831.

Eimac 8930 valves, same as 4CX250R but with 2in anode, 350W diss, brand new, boxed, full spec, unused, £50 each or £90 pair. G4IYA, QTHR. Tel Shorne 3172.

Advance digital multimeter type DMM2, operates from ac mains or built-in nicads, an exc bench or portable instrument, £70. Bauer single paddle keyer, £5. FDK Multi 700E, mint cond, used few hours only in orig packing, £150. Tel Codsall 3134.

Tono 350 cw/rtty/ASCII rx, boxed, months old, sell or exchange for YO901P. Olympus OM10 35mm slr and Sinclair ZX81, will sell or exchange for 2m fm handheld and cash adjustment if required. GM4PSF. Tel 0294 62955.

Rotator, Emotator model 103LBX, no control unit, £25. Buyer collects please or pays carriage. Tel Harlow (0279) 32809.

Yaesu FT290R, one year old, listen on input, brighter audio mods, £220. Muirhead D900 DSA facsimile rx, comp with psu, recording paper, manual, £50. G8ZLD, QTHR. Tel 08893 3937.

Teleprinter 7ERP, good cond, £25. Tape sender 6S6M, good cond, £10. Transformer, 240V/140V, baud setter, tuning fork, £5. Terminal unit, unused, suit Creed 444, £60. Vertical hf antenna, TET MV5BH, unused, boxed, £40. Genuine reason for sale, bought a microdot. G6DCP. Tel Bracknell (0344) 28218.

Racal MA282 adaptor unit for use with RA117/RA66 combination, comp with handbook, all interconnecting cables, £40. Morris. Tel Bolton 52384.

QTH: larger superior-styled semi-detached house, three bedrooms, lounge, dining room, extended kitchen and wc, bathroom and wc, hall, porch, central heating, fitted carpets incl, brick detached garage, garden shed, superb radio site, open aspect to rear over farmland with panoramic views, one room fully fitted out as radio shack, 60ft Versatower (with planning permission), 3-el tribander beam, vhf and dipole antennas, these items included in house price, £40,000. G4EMT. Tel 051-426 6139.

FT207R, NC1A charger, needs new battery, hence £60. MM1000KB morse keyboard, £60. Any carriage extra. G4BGE, QTHR. Tel Bracknell (0344) 21502.

Yaesu YD844 high impedance desk mic, Vibroplex bug key, first reasonable offers secure. Call and haggle. Free to deserving cause: KW Vanguard tx, come and collect. G3DRN, QTHR. Tel 01-947 3914.

Strumech tower P30, comp with rotator head, post mounted, delivery by arrangement, £325. G3XPD. Tel 0785 74445.

FT7, spotless, orig packing, no mods, but with 10A and 10C xtals, £250. Zetagi B300P 300W broadband linear, £70, or £300 the pair. G4KGE, QTHR. Tel Ashtead (Surrey) 74714.

Collins 500kHz mechanical filter, 3·1kHz wide for 51J4, many *QSTs* from 'thirties, *COs* from 'forties, odd *TRs* and *Bulletins*. *Wanted:* Various *T&Rs*, bound *QST*, *CQ* etc. QTH still for sale, Baker, Bontnewydd, Aberystwyth, Dyfed. Tel 097-421 608.

FT101 Mk2 160-10m, G3LLL rf clipper, spare valves, cw filter, FV101B, SP101, af filter, £315 ono. Magnum 2, 2m transverter, fits above, £50. G4LDS, QTHR. Tel 0245 69034, evenings.

QTH: spacious, three bed, ch, semi/det cottage, in half acre, hill location, lovely views, not isolated, 60 by 30 modern building incl, workshop, machine shop/store, Colchester lathe etc, productive garden, mains services, incl lathe, £27,000 ono. Tel Waterman, 0269 870139.

TS130V mic, SP120 ext spkr, few months old, £375. TR7800, perfect, £190. 10m ssb tx/rx, 28·50-28·95, has import licence, £65. 10m fm tx/rx, *R&EW* dnt conversion, 29·30-29·69, £45. GM4DHJ. Tel 041-889 9010 (Paisley).

Heathkit HW32A 20m 200W tx/rx, ac psu, manual, £75. Mobile psu, £20. Datong automatic transistor op-amp tester, unused, manual, £30. VCR139 crt, mumetal screen, base, £12. G4AR. Tel Eric, 01-661 3604, office, Ashtead (Surrey) (03722) 72515, evenings.

Must sell, now retired: FT901DM and FT480R, perfect in all respects, highest offer secures, sell separately. G3HS, QTHR. Tel 036-782 627.

Trio R820 rx, mint, £475. Yaesu FR101D rx, 2-6m converters, £185. AR88D rx, no mods, spare valves, spkr, £85. R. C. Ebden, RS33464. Tel 01-467 5908, evenings.

Welz SP15M pwr/swr meter, £20. Toyo T435N pwr/swr meter, £20. Yaesu YD38 mic, £12. Drae 4A psu, £15. Hokushin 8λ/8 mobile whip, unused, £10. Commercial 10A psu, £15. CDE AR40 rotor, £45. G4OWN. Tel Flitwick (Beds) 714003.

Trio TR9000 2m multimode tx/rx, fm/cw/ssb, comp with inbuilt preamp, K tone generator, mobile mount, handbook, orig packing, vgc, £265. Western DX33 tri-band Yagi, worked 235 countries, varnished elements, vgc, £85. Delivery possible within 100 miles. G4AAQ, QTHR. Tel 0977 791071, after 6.30pm.

PW Nimbus tx/rx, in exc wkg order, incl transmitting and receiving xtals for S20-22, R4, £50. *Wanted:* morse tuition tapes or tutor. Consider exchange for Datong morse D70. Tel Lavington 8467, daytime, or 3462, evenings, weekends.

Icom portables: IC202S ssb tx/rx, 144·0-144·4MHz, 144·8-145·0MHz; IC215 fm tx/rx, fully xtalled on popular simplex and repeater channels, for each unit with full accessories, £100 ono. G4JDF, QTHR. Tel Chelmsford (0245) 465421.

Jaybeam vertical ten-fifteen-twenty, erected December, still in use but going rotary, can be inspected in position from flat roof, easily taken down, carton as new, £35. G6WU, QTHR. Southgate N14. Tel 01-886 8858.

HC1400 2m fm mobile tx/rx, 5/25W, three memory channels, good as new, £125 ono. G8UHX, QTHR. Tel 0204 35100.

Unhappily I must part with my beautiful Dentron linear amp MLA2500, it is still as new, hardly used, orig packing, only sensible offers please. Buyer collects. G3KUF, QTHR. Tel 0272-296544, days, 027581-3648, evenings and weekends.

TR7010 2m 8W ssb/cw tx/rx, 144·100-144·335, additional xtal enabling 144·045-144·065 operation if desired, service manual, mobile bracket, exc cond, reason for sale? need hf gear, £90. G4NVQ, QTHR. Tel Hastings (0424) 420608, evenings/weekends.

Trio R1000 gen cov rx, 200kHz-30·0MHz, a.m., ssb, cw, exc cond, used little, £205. G8TUL, 11 Willaston Avenue, Blacko, Nelson BB9 6LU. Tel Nelson 68548.

Trio TR7600 2m fm tx/rx, RM76 microprocessor control unit, 5kHz steps, scanning facility, 10W output, orig packing, £140. G8VAS, QTHR. Tel 0279 57448 (Herts).

88mH toroids, American open pattern, suit BARTG, ST5, ST6 etc, £2.25 incl. Chris Pedder, G3VBL, "Thorncliffe", 5 Royalty Lane, New Longton, Preston PR4 4JD. Tel 0772 612289.

Trio TS700G vhf multimode and vox unit, built-in switchable preamp, £235 ono. Trio TR7850 40W vhf fm mobile, £265 ono. SOTA 100W vhf linear, £75 ono. Kenwood 15A dc power supply, £70 ono. G4OYQ. Tel Godalming (Surrey) 4491.

75ft Western Electronics HD4FP wind-up tilt-over, electrically operated, Hygain rotator HD300, l.e.d. readout, Wilson System 40 ant, 10-el tri-bander, 10-15-20, galvanized earth plate, 1m sq by 18mm thick, comp with 12ft copper cable, 1sq in section, above items one year old; the following items new: 55m coaxial cable RG213U; 50m heavy duty eight-core multiflex rotator cable, 40m three-core multiflex power cable, all associated fittings, instruction books, £850. Assistance with carriage. G3JER, QTHR. Tel 09062 2549.

DX302 rx, 0-30MHz, synthesized, triple conversion, as new, £150. G6NVS, QTHR. Tel Lichfield 52824.

FRG7700 with memory, £370. Daiwa auto atu, CNA1001, £140. Microwave Modules transverter, 432MHz output, 28MHz input, £130. All mint cond. Channel Master rotator type HD9508A, unused, £40. G4LU, QTHR. Tel 0691 830277, daytime, weekdays only.

ICF 6,700W communication rx, 0-530-30MHz, usb, cw, a.m., fm, mains, battery, manual, exc cond, performance, l.e.d. frequency readout, headphones, £190 ono. Tel Torquay 605799.

Trio 2200G, nicads, charger, all accessories, seven repeater, five Simplex xtals, £65. VB2200 10W amplifier for same, £25. Manuals for both or the two for £85. G3UXU, QTHR. Tel Sheringham (Norfolk) 824078.

TS520S, £350. VFO 520S, £50. MFJ945 all band tuner, £25. MC 50MHz, £15. 18AVT/WB, £45. All

absolutely mint cond, hardly used, original packing, accessories, manuals. G4HQN, QTHR. Tel 0503 30380 (Plymouth area).

MML 144/100LS 2m 1 or 3W ip, preamp, mint, boxed, £90 ovno. G4PCM. Tel 0386 830614.

Computer: Microtan 65, Tanex, ASCII keyboard, 4k ram, morse and rtty software, £150. G6NVS, QTHR. Tel Lichfield 52824.

TH3JR 3-el triband beam, very compact, £60 ono. Ambit ssb filter for FRG7, cost £30, yours for £10. GM4NFI, QTHR. Tel 0397 4361.

AR88D comms rx, rewired, good cond, £100 ono. BC221 freq meter, good cond, £20. Buyer collects. Tel Botley, Watford 20977, between 9am and mid-day.

Microwave Modules 144/28 transverter, £70, incl postage. G2BCX 16-el vhf beam, £20, or swap trap vert, 10-20m. Xtals for Pye Vanguard. GW4RQQ, QTHR as GW6ITL. Tel Menai Bridge (Anglesey) (0248) 712763.

Yaesu FRG7, with fine tuner, £135. Sony 5090 gen cov plus airband, bfo, £90. Grundig Satellit with bfo, £90. Hallicrafters SX43, matching spkr, offers. SX100 bfo, needs attention, offers. Hallicrafters SX110, good, £75. Sony CRF160, £95. Tel York (0904) 59035.

TS130S Trio Kenwood hf tx/rx, 100W out, mic, service manual, six months old, £465. FTDX401 hf tx/rx, 80-10m, mic, needs attention, 80-40 bands, as power low capability, 560W p.e.p., £150. Pye FM15 Westminster on 2m, £75. G4HHA. Tel 0473 79935.

Yaesu FT207R 144-146 handheld, 2·5W, combined base power supply/charger, spkr mic, two nicads, helical, λ/4 antennas, case, boxed, exc cond, all for only £140. Tel 01-462 3392 (Bromley).

FT200, FP200, hf tx/rx, psu, in orig packing, handbook, recently revalved, spare set incl, all 10m xtals fitted, good hf rig, £225. Can demo on sked if required. G3TVR, QTHR. Tel 07462 5624.

HQ1 mini beam, one year old, £70. HF5 and HF5R, £35. Buyer to collect. G4GIX, QTHR. Tel Godalming 29283.

Masting, galvanised steel lattice sections, 12ft 6in by 14in, triangular, £30 each. *Wanted:* hf tx or tx/rx. Eddystone 770R. Eddystone 770U. G4OPE. Tel Mick, 021-743 5093.

Microwave Modules 2m transverter, £55 ono, or exchange for good cond hf vertical ant, HF5, 12AVQ or similar. G4NMR, QTHR. Tel 0905 423723.

Cushcraft A3 3-el hf beam, 10/15/20m, dismantled ready for transport, £130. G3VQL, QTHR. Tel Shrewsbury 55179.

Trio TR9000 with MC50 desk mic, fist mic, workshop manual, never used mobile, £270. RTTY station, HBR Electronics keyboard, etc, tx/rx, 45/300 bauds, used little, part exchange 2m 100/150W linear against rtty equipment. G5NCK NOT QTHR. Tel 01-370 1185.

TRS80 16k level 2 computer only, psu, demodulator, volumes 1-8 *Encyclopedia for the TRS80,* £200. G3WYU. Tel Ramsgate (0843) 587548, evenings and weekends.

Yaesu FT902DM, FC902 atu, Yaesu filter, FF501DX 25Ω, paddle key, Welz dummy load, 50Ω CT150 Yaesu mic (desk), YD148 ear phones, boom mic, standard mic, Yaesu spkr, ant, AV3 ant, inv 'V' multi trap dipole, inc all coaxial, all items, £900. No items sold separate/ going QRT. K. Thompson. Tel Whalley 2036.

Tektronix 545A oscilloscope, type 545A, CA and L plug-in units, 32MHz dual beam, workshop manuals, new spare valves, perfect wkg order, sell £250, or exchange w.h.y? *Wanted:* HF gear, FT401, accessories, etc. G4REZ, QTHR. G6HSH. Tel 0209 216542.

Yaesu 902DM, new, unused, £850 ono. Icom 240, tested, £110. Reason for sale, eyes not good enough, blind. Member of RAIBC. Tel Taylor, 072278 396.

Trio TS120V, MC35S, £275. TL120, manuals, £100. G4JQO, QTHR. Tel King's Lynn (0553) 840401.

FT480R 3SK88 front end, auto toneburst, listen on input mod, two mobile mounts, case marked, therefore only £260. Pye PF1, pair RB4, pair SU20, nicads, wkg OK, £25 pair. G8UQE, QTHR. Tel 061-736 1734.

UHF standard C7800, 10MHz coverage on 70cm, five memories, scanning, up/down mic control, 10W output, good cond, £190. G8WQV, QTHR. Tel 0634 221061, evenings and weekends.

Shimizu Denshi hf rig, noise blanker, cw filter, all 10m xtals, £250. G4MLA. Tel 02345 7087.

FT221R 2m all mode base station, vgc, £280. IC202S, mint, comp with nicads, case, extra xtals, 100W solidstate linear amp, £200 or will split. Six-el Jaybeam quad for 2m, £15. G4GZS, QTHR. Tel Rugby 815506.

Datong up-converter, superb reception, lf to 30MHz from any multimode 2m rig, recent check by Datong, £65, post free. G8SEE, QTHR. Tel 0209 716526.

Trio 2200G, fully xtalled, cw 10W amp, mobile mount, helical, new nicads, base station use only, £95. SMC HF12A12 fm monitor rx, fitted S20-23, R0-7, £35. Both really fb cond. Savin, G4OYP, QTHR. Tel Nottingham 254741.

Yaesu FT220 (forerunner FT221) 2m tx/rx, fm/ssb/ cw, rptr shift, £200 ono. Sig gen, £15. Grid dip meter, £20. Coaxial line filter, £10. Cantenna dummy load, £7.50. SWR meter, £10. Coaxial switch, 1-4, £7.50. G8BPK, QTHR. Tel 0268 777934.

Yaesu 902DM, used in transmitting mode for a total of one hour only, genuine reason for reluctant sale at bargain price of £750 ovno. Tel Preston (0772) 742922.

Trio TR7200G 144MHz fm tx/rx, fitted S16-23, R3-7, 144·48, 144·775, £80 ono, for quick sale. G4HZV, QTHR. Tel 0483 811597.

KW G-line, KW204 tx, KW202 rx, KW107 Supermatch, KW202 spkr, comp with handbooks, all connection leads, spare pair 6146 valves, mint cond, £400. Delivery possible locally. Will not split. G4KKG, QTHR. Tel Yeovil (0935) 25327.

Sommerkamp SOKA747 560W, 80-10m incl WWV and two-aux, £210. Moving abroad, reluctant clearance. 16-el Tonna, 18-el Parabeam, 8-el Jaybeam, 6-40A 2m pa, *Rad Com* 1968-82, valves, transformers, psus, components, all must go, come and haggle. G4AHN, QTHR. Tel 0252 877195.

IC740 100W hf rig, IC740PS internal type mains psu, both unused items, brand new, boxed, as purchased from Thanet in Jan, will exchange for your new or mint NRD515 rx or w.h.y? G3SPJ, QTHR. Tel 01-311 8405.

Forced to sell Sommerkamp FT902DM hf tx/rx, FC902 atu, SP901 spkr, only two months old, Yaesu base mic, all boxed, as new, £850. Tel 0704 36360, after 6pm.

FT480R 2m multimode tx/rx, £290. SOTA 40W linear amp, switchable preamp, power amp, £40. Both 15 months old, vgc. Would consider exchange plus cash adjustment for good Mk3 FT101ZD, fm, or TS830S. G4OXD. Tel 0462-35248, after 6pm.

Trio TS120V QRP rig, matching psu, orig boxes, manual, £325. Datong FL1 filter, £35. Shure mic, £5. Homebrew speech processor, £10. Homebrew morse bug, single/double paddle, adjustable speed, £25. G4ISO NOT QTHR. Tel Stevenage (Herts) 62829.

Micro computer case, room for all electronics, fan, crt, £25. Philips floppy disc drives, comp, need attention, £50 ono. SAE details. *Wanted:* Sony Betamax equipment, tapes, EC10, sound mixers, mics, reel-to-reel recorders. M. J. Ganley, 4 Walnut Grove, Trowbridge, Wilts.

Trio TS820 dfc, MC50, manuals etc, £425 ono. G4JQO, QTHR. Tel King's Lynn (0553) 840401.

IC740, FL53 cw filter, 250Hz at 455kHz, new, boxed, data, fitting instructions, cost £69, accept £45. FL54 cw filter, 270Hz at 9MHz, boxed, data, etc, cost £37, accept £24. G3SPJ, QTHR. Tel Colin, 01-311 8405.

2m multimode, FDK M750X, brand new in December 1982, mint cond, never used mobile, orig packing, bargain, £175. DRAE 12A psu, £30. FX1 wavemeter, £15. G6ADL, QTHR. Tel Kettering 710004.

SEM Z-Match atu, 10-160m, tunes balanced/ unbalanced antennas, exc, £35. Casio watch alarm/ chrono/timer, new £29.95, £15. Folding bicycle, £25. *Wanted:* urgently—2m portable rig, Trio 2300 or other, pay up to £100. 70cm linear amp. G6ASA. Tel Oxford 863333.

Azden PCS300 2m fm handheld, lcd readout, band scan, etc, mint cond, boxed, ready to operate, £160, or swop for mint Trio R1000 or Drake R4B rx, with cash adjustment. Tel 0373 64694, nr Bath.

Yaesu FT107M/DMS, FP107E ac, SP107 spkr, FC107 atu, YM35 scanning mic, £575. Pick up only, would consider part exchange for FT225RD, IC251, TS130V, TenTec Argosy, TS120V. G5DEH, QTHR. Tel Newmarket 664757.

KW2000A, ac power supply, works manual, in superb cond, Shure mic, Moseley TA33JNR beam, CDRTR44 rotator cable, control, £300. Home built top band tx, power supply, £12. G3RGA, QTHR. Tel 0279 850 458.

Tower, 60ft three section telescopic, tiltover, single Harvey Frost winch operation, mounted on heavy duty braked road trailer, foldaway stabilizers. ideal solution for planning problems, rallies, etc, £500. Transverter, Trio TV502, £40. G6DMS, QTHR. Tel Great Easton (Essex) 250.

Small Philco bc rx, £10. *Wanted:* Vibroplex or other semi-automatic key. Set of unused ux valves for a 2V superhet. FT243 xtals for 40m. G4IMT, QTHR. Tel Marshfield 254.

FT708, spkr, mic, £160. Transverter MMT 432/144R, £110. PF1, xtalled for Manchester repeater, charger, manual, £27. All incl postage. Tel Whitehaven 61389.

Semi-automatic bug keys for quick sale: Vibroplex Champion model, £10; a similar key by Lionel, £6. Postage to be added for each. G3BDQ, QTHR. Tel Pett 2262, evenings.

Palm 2, channels S18, 20, 22, R1, 2, 6, spare R7 incl, nicads, helical, charger, £70. G4DBE, QTHR. Tel 051-648 6525.

2m converter, Microwave Modules 144/28MHz, £10. 1·5in 1mA meter, £1. Assorted valves, numerous service sheets for radio/tv between 1955/80, 50p each. Postage extra. No lists. Send sae enquiries. G3DVL, QTHR.

Realistic DX300 rx, cw handbook, circuit diagram, surplus to requirements, £90 ono. A. S. Hawley, 114 Brooksby Lane, Clifton Estate, Nottingham. Tel Nottingham 841520.

TR9000 with BO9 base, all in orig packing, £275 incl carriage. GM4NHL, QTHR. Tel 0847 65460.

Datong morse tutor, orig box, £35. 19 set, conical rubber antenna base, offers? Plus p&p. Anthony Richards, GW4RYK. Tel Abermule 255.

FT480R 2m all mode tx/rx, comp with up/down mic, mobile mount, exc cond, no mods, £285. G4OYH, G8TLV, QTHR. Tel Southend (Essex) (0702) 333330.

Morse tuition programs on tape for VIC20, Spectrum, ZX81-1k, ZX81-16k (specify), full operating and learning instructions, a complete, flexible system, generating characters in easy, selectable stages, to get you that A licence, £5 each. GW3RRI, QTHR. Tel 0286 881886.

Bargain: Icom 720A, brand new. Tel Derby 557705.

Drake R4C, MS4, extra xtals, gc, £225. SOTA 100W linear int psu, as new, £150. TR2400, £100. Manuals and orig packing. GM3PGH, QTHR. Tel 041-637 9726.

Drake C-line, R4C, T4XC, AC4, MS4, a.m., filter, 15 xtals, spares valves, finals etc, handbooks, late serial No 5, immac, Hokushin, 10/15 3-el beam, Trio TS9130, as new, Jaybeam, 4-el quad. GI3ZSC, QTHR. Tel 08-494 72378.

Icom solidstate hf tx/rx, IC730, first class cond, cheap, £425. Carriage at cost. GD3KHE, QTHR. Tel 0624 6636, evenings.

SX200N, mint, as new, used little, CPE as purchased new six months ago, £200, carriage paid by Securicor. R. J. Newey, 23 Leahouse Road, Oldbury, Warley, West Midlands. Tel 021-544 6171, after 6pm.

Philips valved cctv system, comp, may need attention, exchange for any useful vhf/uhf gear, modern hf rx etc, offers. STE Arac-170 10m and 70cm all-mode rx, used little, exc, £80 ono. GW6AYM, QTHR. Tel Swansea (0792) 204146.

Swan SS200 solidstate tx/rx, 80-10m ssb/cw, 200W input, matching psu, spkr, manual, £225. G4BVI, QTHR. Tel Ipswich (0473) 53270.

KW2000, ac psu, manual, new 6146, needs alignment but otherwise ok, hence price, £50. G4LEX. Tel Gloucester 421013.

70cm transverter, FDK expander, 430 for FDK750E 2m, also 70cm 6-el quad, both mint, £120. Prefer buyer collects. G3PY, QTHR. Tel Glossop 61062.

100ft free-standing heavy duty mast, not erected, in 0·5 acre site, with superior detached four bedroomed house, features include double garage with space over for granny flat or playroom, utility room, two bathrooms (one en-suite), two further double bedrooms possible in roof space, somewhat isolated location 13 miles south of Norwich, £65,000. G3RUT. Tel 0508 30973.

TR2200GX, fitted S20, 22, 23, R2, 14480, provision for 12 xtals, nicads, charger, case, etc, perfect, Catronics Eurocat ES80 synth, needs setting up, £100 ovno. G3UJB NOT QTHR. Tel Brayford (05988) 327.

Kenwood TS520SE, mint cond, 500Hz cw filter, Lowe 10MHz band, orig packing, £370. Heathkit SO2 scope, £35. G8CZW, 20Hz-60MHz dfm, £35. Working A1 Mk3 spy rig, phones and manual only, £35. G4EZF, QTHR. Tel Dave, Mottram 62799.

FT401 hf tx/rx, 80-10m, 560W p.e.p., high power rig, revalved with accessories, vgc, matching homebrew 2m transverter, 6/40 in final 100W p.e.p., comp hf/vhf station, £300 ono. G3RXQ NOT QTHR. Tel Dunstable (Beds) (0525) 220617.

Photax 7A 40·5mm filter, metal/rubber lenses hood, £3. Sleeping bag, £8. Slide rule, good quality, like new, £5. Pifco infra red radiant heat, old but exc cond. *Wanted:* old GPO or army key. P. W. Hall, 10 Dulverton Square, Leeds LS11 0LL.

UK101 separating system, main board cased, 8k ram, fan, hi-speed tape interface, cegmon, £145. 24k ram address decoded 2000-7FFF, fully wkg, uses 48X2114S, £65. Prog graphics board, £29. 16k eproms, decoded, £40. Other items. G3XIB, QTHR. Tel 021-453 4004.

TenTec Omni-A, £350. TenTec power supply, £75. Iambic keyer paddles, Bencher, Brown Bros (two), £20 each. Black & white 12in vdu, new, unused, £75. Prefer buyer inspects. G3MRP. Tel 021-783 4771.

IC2KL, IC2KLPS, property of late G3AYA, £650 both. G8YAW, QTHR. Tel Hoddesdon 468394.

Mint cond Yaesu FT707, FP707 psu, FC707 atu, used only in rx mode, genuine reason for sale, £600 ono. Jaybeam TB3 tribander, only three months old, £130. Tel Phil, 01-582 2877, daytime, 01-582 3541, evenings.

Western 3HD 58ft tower, vgc, dismantled ready for removal, £425, or will exchange hf/vhf gear, small car, or what have you. Cash adjustments. G4JGP, QTHR. Tel 051-644 7118, after 6pm please.

RTTY vdu converter, hb, G3PLX design, uhf modulator, commercial keyboard, £75 ono. 2m Halo, Taylor multimeter, 10/15/20m quad, less wire, offers? Prefer buyer collects. G4BKE, QTHR. Tel Winchester 61133.

DX160 comm rx, 150kHz-30MHz, property deceased swl, £60. GW4KUS, QTHR. Tel Gorseinon (0792) 892165.

G4MH mini-beam, as new, £55. AR40, silent control box, cable, £50. Both for £100. CT212 sig gen, £15. TS510 with cw filter, £200. *Wanted:* TenTec Omni B/C/D, must be immac. Tel Bob, Crewe (0270) 841168.

Trio TS830S for £530 or less. I require separate tx, rx, w.h.y? Selling the TS830S for £530, no offers or time wasters. *Wanted:* TenTec Century 21 cw tx/rx. G3YRQ, QTHR. Tel Ian, 0942 679948.

IC2A plus accessories, BP3, λ/4 telescopic, fist mic, etc, £130 ono. TS130S mobile station, boxed, as new, G-whip tribander, 10-80m, £515 ono. Richard Jones, GW4MPX. Tel Newport (0633) 270110, ext 2323, work.

Telequipment scope S51B, £50. 2200G 11ch, £60. Belcom linear amp LA106, 200W input, preamp self contained, £90. Enlarger lens, 2in, 3·5in, £5 each. G8EGF, QTHR. Tel Edenbridge 862014.

MM4000 rtty micro processor terminal unit, cw RCA touch keyboard, perfect cond, £230 ono. G3ZJU, QTHR. Tel 01-527 4492.

42ft aluminium epoxy resin coated lattice mast, £150. FTV250 transverter, £90. Viango diesel generator, 110V ac, at 25A, £150. Taylor valve tester type 45C, £15. Cossor 527X vintage rx, offers. 19in rack, pa system, valved, free to collector. G3UXH, QTHR. Tel Medway 250562.

MMS1 morse talker, comp with 12V power supply, £65 ono. Daiwa PS300, power supply, 9-15V, 30A, peak 22A continuous, as new, boxed, £75 ono. TI59 programmable calculator, comp with PC100 printer, 960 step program, 100 memories, offers? G4RKO. Tel 0245-469683.

QR666 Trio rx, QR6MK option, in orig box, comp with manual, leads, etc, £60. Pair PX25s, brand new, offers? G6RHP. Tel 04747 3363, evenings, or Dartford 27222, weekdays.

FT290R MML 144/25, Tonna 9-el beam, mobile halo, all immac, £240. 10m 10W fm mobile rig, WAC, USA repeaters, all mobile, £50. G4NXX, 12 Bridges Close, Abingdon, Nr Oxford, Tel 0235 25898, after 5pm.

Trio TR2300, all bits, nicad charger, 5λ/8, ant, asp, lead, mag base, mint cond, hardly used, £160. G4CZD, QTHR. Tel Gravesend 61252.

Microdot rtty/cw communications terminal, as new, £350. Cambridge kits msf clock kit, never assembled, £45. Microwave Modules MMT144/70 2-4m transverter, never used, £90. Modular Electronics 2m linear, 40W output, 10W in, 12V, £25. G3VGW, QTHR. Tel Derby 810760.

Heath linear model SB220, in unused cond, stored six years, comprehensive handbook, exchange for gc rx, GEC, Eddystone, HRO in vgc. *Wanted: Radio Communication* March 82, cash adjustment where necessary. BRS18568. Tel Marlborough (Wilts) (0672) 870866.

SB101 tx/rx, matching spkr, psu, cw filter, all ccts, good specimen, £200 ono. Buyer collects or carr extra. Please write not telephone. G4INP, QTHR.

Trio 2300, charger, nicads, £105. IC2E, case, £100. IC255E, mounting bracket, preamp, internal, £150. Standard C146A, S20, S22, R3, R5-6, £50. Eddystone 880/2, £225. Palm 4, xtals, eight repeaters, three simplex, spare nicad pack, external nicad pack, £125. Owen, G4HMF, QTHR. Tel Ipswich (0473) 51319.

TS520S, 160-10m, cw filter, mic, immac cond, cw boxes, manual, £345. 4X250B, bases, four, 12-0-12V, 20A transformer, £8. RG62 93Ω coaxial, 50ft lengths, £3. G4GRU, QTHR. Tel 061-440 0556.

Icom IC215 fm 3W portable, 15 channels, nicads, £90. TVI rec filters, £1 each. UHF-vhf radio converter, 450-458MHz to 100-108MHz, £5. G8RHU NOT QTHR. Tel Newhaven (07912) 6801.

IC202S, as new cond, £125. IC240, vgc, £110. Buyer collects. Would swap either for IC2E. G8YCW, QTHR. Tel Ashington (Northumberland) 818773, after 7pm.

Marconi rx, 118M, 150-275kHz, 2·0-18·5MHz, psu, circuit, £40. Murphy Admiralty rx, 60-180kHz, 1·5-30MHz, incl modified Solatron psu, handbook, £50. BC221M freq meter, psu, £20. Buyer inspects, collects. RS49773. Tel Sheffield 302841, evenings.

144MHz 500W linear kit: twin 4CX250B, K1RIW, in orig packing, as received from GJ4ICD, £285. 144MHz 100W linear, MML144/100S, as new, £99. *Wanted:* backnumbers *VHF Communications.* G4NVA, QTHR. Tel Cheshire (0477) 33011.

Eddystone 880/2, £150. 840A, £35. Trio 9R59DS, as new, £45. Avo valve voltmeter, £20. Second world war equipment: RAF 1154/1155 installation, £120; R1132, £25; WS38, R107, WS62, R1392, xtal calibrator, offers. *Wanted:* HC6V xtals, 3·72031, 3·75156MHz. G3DVF, QTHR.

Icom ICSM5 desk mic, £20. Nine-el 2m Tonna, £12. *Wanted:* Microwave Modules 4m converter. G3WBN, QTHR Tel 01-654 2761.

FDK Multi 2000, fm/ssb/cw, 2m tx/rx, 12V dc/mains, workshop manual, £180. *Wanted:* Trio DG5 digital display for TS520S. G4DCX, QTHR. Tel 0272 671409, evenings.

FT290R, Microwave Modules, 2-10m transverter, comp with case, helical antenna, nicads, exc cond, £250. Various communications rxs, CR100, SX27 etc, around £30 each. Suit swl. Tel Basingstoke 882769.

MZ80A Sharp micro 32k, software pack, QRA locator, music, UK map programs, £400. G6ICO, QTHR. Tel Basingstoke (0256) 56356.

TS520S, mint cond, DG5 freq counter, in orig packing, £350. Tri-band hf beam, £35. Transistor dip oscillator, £20. Dummy load (150W), £10. Tel 01-952 9548, after 4.30pm.

FT227RA 2m fm tx/rx, very sensitive rx, 10W tx, 25/5kHz step/scan, four memories, reverse repeater, mobile mount, immac cond, £150. Going hf. Tel David, G4RMC, ex-G8ZNC, QTHR. Tel Garston (09273) 79567.

MM4001KB, new, £240. Heath IG4510 dbl beam scope, £250. Heath IG5237 fm sig gen, unused, £70. Drake W4 wattmeter, £30. TR7 psu, £100. MMT432/28S, £100. Star 2m tx/rx, £35. Protax antenna switches, various, £15. Prefer buyer inspects and collects. G3NAC, QTHR. Tel 0954 60584.

Eddystone 730/4 gen cov rx, 480kHz-30MHz, good working order, manual, incl cct diagram, £125 or will haggle. G4HHJ, QTHR. Tel Dave, 0432 266920.

Don't build that cw tx, buy this fb DX40, with 6146 pa, £25. Matching VF1U vfo, £10. G3JIB, QTHR. Tel 061-681 5117.

TS120S, mint, not used mobile, hb, 30A, 13·8V, protected psu, Transmatch hb part cons, large caps, roller coaster, Shure 201 mic, 2XQQV0640. G3ZIF, QTHR. Tel Huddersfield 863936.

FT101Z, six band, cw filter, fan, exc cond, many extras, inc vhf transverter, £350. G4MDS, QTHR. Tel 07816 2905.

FT707, FP707 psu, £485, no hagglers. Buyer collects or pays Securicor. Eight-el 2m beam, £6. *Wanted:* FT101ZDFM tx/rx, copy of circuit diagram FL2100Z linear, your costs refunded promptly. G4DIC, QTHR. Tel Hinckley 636315, evenings.

FRDX500/FTDX500, good cond, 240W p.e.p., £240. FDK 750E 2m multi mode, nine months old, as new, still under warranty, £210. G6LCY. Tel Sudbury (Suffolk) 79498, after 6pm.

Azden PCS300 fm 2m handheld tx/rx, as new, full frequency coverage, memories, bandscan, incl nicads, battery charger, additional mic/spkr, manual etc, £120, no offers. Magmount with λ/4 whip, £5. Buyer collects. G8OVQ, QTHR. Tel Tiptree 816677.

G2AKQ closed down: 23cm ring of six 3CX100A5S linear on 10·5in relay panel, 7in metering panel, input output, matching tuners, heavy duty blower, ht required, 1,200-1,800V at 750mA, £400. G2AKQ, QTHR. Tel Ringwood 5643.

Sommerkamp FT902DM nine-band tx/rx, a.m., fm, cw filters, inverter, fan, mic, all orig plugs, leads, handbook, comp as possible, vgc, genuine reason for sale, £700 ono. GW6NHB NOT QTHR. Tel Cardiff (0222) 561360, ask for Keith.

Transformers: 100VA radio spares, 207-295 prim, 120/240V, two secs, 12V at 4·1A each, almost new so £5 plus carr, or buyer collects. 20ft caravan, suitable as shack, store, etc, £25, buyer to remove. G8YHL (now G4RLM) QTHR. Tel Wimborne (0202) 887947.

Microwave Modules MM4000, keyboard, rtty, tx/rx unit, used very little, £200. G4HTE. Tel 881 0616, daytime, Potters Bar (0707) 54905, evenings.

TS788DX 10m all mode tx/rx, £300 ono. Three-el Yagi suitable for 10m, £35. G4MHR, QTHR. Tel 0763 71160.

Sony ICF2001 synth rx, 150kHz-30MHz, auto scan, memory, much more, £110. Casio HR12 accounts calculator, rolls, £12. Prinztronic scientific calc BSC750, £6. Power supply for Sony rx, £5. Everything first class cond. G4JLV, QTHR. Tel Julian, Reading 478165.

TS520, integral 12V power supply, unmarked, orig packing, one owner, any trial, £270. G3KAJ, QTHR. Tel Chorley 71343.

Toshiba TMC1AX mono television camera, comp with 5in monitor, closed circuit system, new, never used, cost £180, offers, or high power lin for 2m or 70cm. Tel Brighton 417120, day, 418713, evenings.

FT207R synthesized hand-held portable tx/rx, slow charger, PA2 car adaptor, four months old, exc cond, £150. G6NQC. Tel Brian, Southampton (0703) 433616.

2C39A, three ceramic, one glass, all tested on 23cm, £10. SE1 1246AX 9MHz xtal filter, £13. Marconi TF1026/3 frequency meter, 1,000-2,000MHz, ideal 23cm work, £25. Tel Jim, 0202 518828.

FT101EE, G3LLL clipper, matching spkr, immac cond, £350 ono. Prefer buyer inspects, collects. G4NKT, QTHR. Tel 0272 564740.

Exchange TR9000 2m multimode in exc cond for TR9500, also to be in similar condition. Possible cash adjustment. G3KIW. Tel 021-705 5249.

Trio Kenwood TS770E, immac cond, used very little, £490. Sorry no part exchange. G8AFA, QTHR. Tel Yetminster (0935) 872011, evenings.

Racal equipment: RA17L rx, 0·5-30MHz, in cabinet, never commercially commissioned, hence as new, £300. RF pre-selector unit for use with above rx, type MA197B, £40. SSB adaptor for use with above rx, type RA63H, £50. LF converter for use with above rx, extends range down to 12kHz, type RA137, £30. Transmitter drive unit, type MA79G, in cabinet, £150. All above in mint cond, handbook, circs, (except If unit). HQ1 minibeam, sound wkg, £25. KW204 tx, 160-10m, handbook, circ, good cond, £125. Datong rf clipper, type D75, £35. Creed teleprinter 444, tape perf, reader, £30. Buyer collect. G4JQN, QTHR. Tel Westbury (Wilts) (0373) 864478.

Standard C58 2m portable/mobile, multimode station, CMB8 mobile bracket, carry case, strap, charger, nicads etc, MML144-30LS linear amp, mobile boom mic, (unused) 5λ/8 mag-mount, all as new, £300. G6KBJ. Tel R. A. Newell, 021-308 3874, (Sutton Coldfield) weekends only.

FT277 (as Mk1 FT101), cw filter, spare pa valves, £180. FT202, charger/stand, £80. FT207R, charger/stand/psu, £150. Philips tv camera, £50. Collect. G4AEU, QTHR. Tel Southampton (0703) 23458.

Trio rx JR599CS, 160-10m ham bands, built-in 2m converter, in exc cond, £160. Buyer collects. G4RHI. Tel 0444 (West Sussex) 451346.

FLDX400, FRDX400 rx, tx, matched pair, good cond, used daily, orig plastic protective covers still over front facias, new spare driver and pa valves, used wkg pa valves, £275. Buyer collects. G4LGA, QTHR. Tel Consett (Co Durham) 502004, evenings.

Trio TX599, RX599, separates, £325. TR7010 2m ssb mobile, £90. KP202, nicads, £30. Microwave Modules 432MHz 100W pa, £150. High band a.m. Cambridge, unmod, £8. Steve Marsh, G4BWG, QTHR. Tel Upper Warlingham 4656.

Transverter MMT432/144R, 14-el beam, £110. 2m mobile whip, magmount, £5. Cordless electric drill, mains charger, £15. G3THW, QTHR. Tel Wolverhampton 773831, business hours.

AOR240, TR2400 spkr/mics, £120 each. IC215, £89. IC260E, £245. TR3200, £120. Creed 75s, 45/50 baud, auto cr/lf reperfs, £65 and £50. VCR, Philips N1700, £98. Marine rx transistor, 250kHz-4·0MHz, ideal df, £55. Telephone autodialler, 99 memories, £52. All in good cond. All ono. G3LZN, QTHR. Tel Warwick (05643) 2014.

Hazeltine 2000 professional vdu/keyboard, RS232 interface, £110. Pye Westminster W15AM mid-band a.m., £65. *Wanted:* McMichael radios, literature, etc. MH components. G8IHF, QTHR. Tel Bagshot (0276) 74426, after 6.45pm.

Shack clearance: Yaesu FT7 hf tx/rx, 28-29MHz on 10m, £250. Icom IC240 2m fm, synthesized 23 channels, safer mobiling, base station, £110. Microwave Modules 2m transverter MMT 144-28, "new model", 7 months old, £75. All exc cond. G4ITF, QTHR. Tel Cosham (0705) 386184.

Mosley trap dipole, 40 and 80m, £10. KT88, boxed, GEC, £6 each or £10 pair. Collect or postage extra. G4ERA, QTHR.

FT227R, plus mag mount, λ/2 antenna, £110. FRG7 rx, no mods, £110. Stolle 2010 automatic rotator, £30. G4DJR. Tel 01-859 1852.

ATV2 video tx/rx, all you need to get on the air (except uhf tv, antenna, vision source), exc cond, going homebrew, 3W psp, lots of fun, £120 new, £90 ono. G6LTZ NOT QTHR. Tel Andy, Milton Keynes (0908) 562057.

Wood & Douglas 70cm 6ch tx/rx, assembled in neat case, aligned, wkg, Pye W15U 70cm 10ch, aligned on 70, transverter, 10m MM, works from 2m rig, 70cm-2m converter, Pye PF1s on 70cm, other goodies. G8XCI. Tel 0992 468052, after 6pm.

Advance TC1A counter timer, £8. FR67U counter, £8.50. Both repair, or spares. RX SR2506, hf, vhf, uhf, requires front end, £7.50. TX/rx, 1·6MHz board, with filter, xtal, £7.50. All ono. Buyer collects, G3JTY, QTHR. Tel 03272 2909, after 6pm.

TS520 ac-dc, vgc, £325. FT75 ac-dc supplies, mounting bracket, hb vfo, £140. Redifon R475 rx, wkg, £35. 500V megger, not immac but wkg, £7.50. Pye rx, vhf, xtal control, vgc, £11. All ono. G3JTU, QTHR. Tel 03272 2909, after 6pm.

Trio AT200 antenna tuner, £75. TS120V, perfect cond, not used on tx, £375. Frequency counter, 0-30MHz, as new, £55. GW8IQC, QTHR. Tel 0633 894708, evenings or weekends.

Icom IC260E, 10W mobile, 2m multimode, extra scanning mic, £245. Yaesu FT720RU 70cm, fm, 10W mobile, £190. Both not mods, orig packing. Suitable antennas available, prefer buyer collect. G4PFK. Tel 021-360 9306.

Sharp RG6550 car radio cassette, pll synthesized digital frequency readout, 15 memories, clock, £100. Exchange for hf rx or 70cm 2m transverter. Pair

pocketphone PF1, SU20, nicads, £15, £15. G6IAF, QTHR. Tel 0482 652491.

Trio TS830S, mint, £550, or part exchange TS130V set up, mint cond. 18AVT WB, exc cond, £45. Buyer to collect. G4BXY, 372 Gosbrook Road, Caversham, Reading, Berks RG4 8EG.

Transistor voltmeter, *Practical Electronics* design, Jan 1965, £8. Dutch radio rotor model 4, as per 6th edition *Amateur Radio Techniques,* page 133, £10. Sine/sq generator, wobbulator, one unit, needs power, £10. *Wanted:* 100A shunt for AVO7. G3RKK rx, Mk2 preferred. Info on Heathkit If generator 1G82U. C. M. Lindars. Tel 01-647 6157.

Yaesu FT480R 144MHz multimode tx/rx, £275. 128 set QRP cw tx and rx, £17. JVC 3040 vhf/uhf dx, tv, 6in, auto plug, £39. G4DTB. Tel Mike, 0432 274971.

KW202 amateur bands rx, good cond, comp with handbook, £120. Buyer collects. G8UAS, QTHR. Tel Warrington (0925) 65657.

Trio TS120V, good cond, MC30 mic, £300. Deliver free within 25 miles Glasgow. Datong ASP speech processor, good results when used with TS120V, £45. GM4KHE, QTHR. Tel Duntocher 73525.

FT101E, £300. 107 atu 75, HQ1, £60. Power meter PM2000, £30. Emotator 103LBX, £65. Bracket/bearing, £10. G4FVD NOT QTHR. Tel Henley-on-Thames 77571.

Standard C58, 25W linear (CPB58), charger, nicads, helical, £260. G4NQD. Tel 0403 67023.

Four Pye PF70 PF2UH pocketfones, two GEC 550 86MHz a.m. handhelds, inc data, nicads, carriage, £25 each. *Wanted:* low band Pye Europa. C. Walton. Tel Southampton 551580.

FT101ZD fm, eight months old, as new, boxed, retubed pa, £480 ono. Got 102 640LE. Tel Wolverhampton (0902) 27251, days, 23105, evenings.

Weston model E665 selective analyser, £10. Wright & Weaire condenser analyser, £10. Avometer model 7, case, £30. Property of the late J. W. Ebbs. Apply G6AGF, 14 Oak Way, Halesworth, Suffolk IP19 8EB. Buyer to collect. Tel 0967 2292.

Heath SB104A solidstate 100W tx/rx, 400Hz filter, noise blanker, HP1144 mains psu, SB644 remote vfo, offers? G3VLT, QTHR. Tel Chris, Wokingham 786305.

Robot 890, as new cond, comp with all cables, handbook, giving away price, £550. G3SVH, QTHR. Tel 0922 414524.

Europa transverter with control box, cables, manual, £45 plus postage ono. G4IEY, QTHR. Tel Cheltenham (0242) 36715.

TS180S dfc, memory unit, cw filter, £425 ono. PS30 available if required, mint cond, orig packing, carriage extra. G3UEN, QTHR. Tel 0262 850258.

Trio R1000 communications rx, HS5 Kenwood phones, rx has had 5h use only, immac, illness forces sale, £200. Tel 061-980 5150 (Greater Manchester area).

Datong rf speech clipper model RTB vgc, £28. SEM hf auto preamp, fitted with SO239 connectors, vgc, £12. G4FXS, QTHR. Tel 021-458 3537.

FT290R, nicads, charger, spkr mic, soft case, MM144/25 power/preamp, £240. G4LRX. Tel John, Farnborough (0252) 515581, evenings.

Trio 7200G 2m fm tx/rx, 12ch, auto toneburst, £70 plus carr. *RSGB Bulletin/Rad Com* 1965-80, prefer dispose complete years, sent for cost of postage. G3UBB, QTHR. Tel 0530 415600.

TR2300, rev rep, nicads, charger, case, boxed, MML144/30LS, 1-3W input, Trio mobile mounting bracket, 2m 5/8 gutter mount antenna, £180. MML144/25, 3W input, £30. All as new. Buyer collects. G4LTM, QTHR. Tel 061-368 9547.

Yaesu FT225RD, vgc, manual, boxed, £480 ono. G6DFT, QTHR. Tel Ian, Hoddesdon 463478.

Standard C146A, 5ch 2W 144MHz handheld, accessories, £55 ono. Sentinel 100 10/100W 144MHz solidstate linear amplifier, preamp, £40. Microwave Modules MMC 432/144S, 432-436MHz down to 144-146MHz converter, brand new, £24 ono. G8GZZ, QTHR. Tel Woking 23506.

Yaesu FRG7700 hf rx, absolutely as new, £225. Realistic PRO2002 a.m./fm scanner, covers 30-800MHz, as new, £150. GM4PGL. Tel 041-554 0516.

Versatower 40ft with Hygain TH3 Mk3 tribander, Daiwa rotator, 2m colinear, 40/80m dipole located in large, easily maintained garden, also modern two-bed bungalow of unique and pleasing design, gas ch, purpose-built shack, window in roof-space, loft ladder, garage, separate workshop, shops, beach easy walking distance. St Austell 2m. Ideal retirement home in much sought after area. G2KF, QTHR. Tel 072-681 2337.

Grundig Satellit 2100, fm a.m., all bands to 30MHz, mains bfo, case, £75. HRO with 10 coil packs, stabilized power pack, case, unmarked, in perfect cond, offers. Books, B&O 2000 deluxe tape recorder, stereo, £35, or offer. Tel Maidstone (0622) 61327.

Creed 7B with ttl interface to connect to computer, spares, £30. Nascom 1, £80. FR50B rx, vgc, £75. All buyer collects. Trio TR7200G 10W, S20, 21, 22, R0, R4-5, as new, not used, mobile, £105. G4BVC, QTHR. Tel 0533 708585.

Trio TS130S with matching power supply (PS30) and atu (AT130), comp with mobile mount, workshop manual, £550. G4PSR NOT QTHR. Tel 01-527 6775, evenings.

SRX30 gc rx, suit swl, will part exchange for RA17L with cash adj, or offers around £90. GW4RGA NOT QTHR. Tel 07456 88480 (North Wales).

Evets audio compandor, Model C1, speech processing on tx and rx, comp with connections to TR9000, £65 ono. *Wanted:* Information on tx/rx for rtty using Acorn Atom micro. G8LHW, QTHR. Tel 0268 742447.

Mosley TA33JR hf beam, £95. KW107 antenna match, £85. Jaybeam 70cm 18-el Parabeam, £21. ASP 70cm mobile colinear with magmount, £15. G3FIF G-whip, hf mobile helical, 80m coil, £29. Stolle automatic rotator with cable, £25. G3UKM, QTHR. Tel St Annes (0253) 711536

Icom IC720A with P515 psu, cw and a.m. filters, not yet fitted, boxed, hardly used, £795. Yaesu FT400, £225. Heathkit SB104 and SB604 kits, £325. P. Barry, G3RJS. Tel Stourbridge (03843) 76570.

Gas at £1.25 a gallon? Buy my slightly used LPG conversion kit, less than half price, only £150. 1·5kVA generator in running order, £120. All ono. Consider trading for any radio gear etc. G6BIP, QTHR. Tel 0480 860396.

FRG7700 plus antenna tuner, mint cond, genuine reason for sale, £295. G3TRB, QTHR. Tel 0905 775206.

TR2200GX 2m tx/rx, fitted S20, 22, 24, R6-7, orig packing, charger, mobile mount, VFO30G external vfo for 2200GX or 7200G, £100 the pair. GW8JHT, QTHR. Tel 0443 207708.

Microwave Modules 432MHz converter, output 28-30MHz, £13. Mizuho Sky Coupler, receiving atu, £21. Tel 0224 643131, after 6pm.

TS120S hf tx/rx, PS30 psu, mic, £350. Datong RFC/M processor, £20. Redifon 2m tx/rx, exc rig, £35. 4m fm tx/rx, £30. *Wanted:* 2-el triband hf beam, TS900 and external vfo. G8NQP. Tel Salisbury 743335.

Icom 701, mint cond, all mod cons, £450. G6PBG, PO Box 83, Crawley RH11 8TZ. Tel 0293 510491, evenings.

Datong up converter, £80. VHF omni-match, £15. HF/VHF swr bridge, £5. 40m + RS UR67, offers? Heathkit OSC1 service scope, £35. Air/vhf band portable rx, £5. ZX81 16k, £50. Seven tapes, 1k, £5. G4RSA NOT QTHR. Tel Blackpool (0253) 405271.

Creed 444, comp with word processor program for Video Genie. Creed 75 plus one for spares. Tape readers. Two 80+80 volt supplies. Spares, £80 the lot. Buyer must collect. G3BJC, QTHR. Tel 02214 2516.

Vertical antenna, Cushcraft ATV5 10 to 80m, can deliver within 30 miles Coventry, £45. G4FSR, QTHR. Tel Coventry 465692.

Trio R1000 gen cov rx, 200kHz-30MHz, a.m., ssb, cw, immac cond, £210 ono. Sealy, G6MBZ, 45 Rope Walk, Melksham, Wiltshire.

Video Genie EG3003, 32k, renumber, audio amp, machine code monitor, keyboard, repeat, plus over £200 worth good software incl cw tx/rx and contest log, £300. TRS80 Level 1, £80. G4NIP, QTHR (Reading area). Tel Dave, 0734 733626.

Manual for Pye Cambridge FM10MC, £2.50. Various Creed rtty equipment manuals, sae requirements. *Wanted:* RAF equipment manuals, especially AP2150A, AP2276 series, AP2887 series, AP2542G, AP2538 series, AP2563 series, AP2557G or AP2557E, AP2536C. G8AVJ, QTHR.

Save £115.20: unused boxed CDE Ham 4 rotator, Hygain 204 BA (20m 4-el Yagi), £400, no offers. ASR33 ASCII teletype stand, tape punch, reader, good mech cond, £95 ono. G3PCT, QTHR. Tel Paul, Chelmsford (0245) 321086.

Rad Coms, 1964-78, some complete volumes, Easibound, *SW Mag* 1956-75, mainly singles, *Wireless World* 1965-81, many complete volumes, *Radio Constructor,* selection radio, electronic and amateur radio books, sae for list. G3CBU, QTHR. Tel 0256 58921.

FT101E, 160-10m, mint cond, 600Hz cw filter, mic, spare pas, orig packing, operating and workshop manuals, £350. G4ASB NOT QTHR. Tel 0473 626205.

Sanyo 2005 stereo music centre, spkrs, orig boxes, manual, £80. Buyer collects from my college address. Jon Jenkins, G4LJW, 197 Gilesgate, Durham.

Icom IC24G, mint cond, used very little, orig packing, £110. G3ZYN, QTHR.

IC25E, Icom, 2m fm, as new, orig packing, £219 ono. G4HHR NOT QTHR. Tel Crawley (0293) 885137.

Trio TR9130 multimode, five months old, £340. Western DX32 hf beam, nine months old, £70. Alumast, hinged base, all accessories, nine months old, cost £283, offers around £190. Daiwa rotator 7500, £50. G3UCE, QTHR. Tel Heysham 51760.

FRG7700M, 12ch memory, as new, boxed, all fittings, £280 incl delivery. J. Davey, G3FPN, 19 Southey Street, Keswick, Cumbria CA12 4EF.

IC255E 2m tx/rx, full scan 144-148MHz, five memory channels, 25W output, exc cond, £160 ono, exchange for FT290 2m tx/rx. GM4PGV NOT QTHR. Tel Irvine (0294) 71417.

FT401 560W tx/rx, manual, £245. Matching spkr, £10. Shure 444 mic, £15. Set new valves, £15. The lot, £280. Datong FL2 audio filter, instructions, £65. SM71 low noise fet, 70cm preamp, £11. G4ALV, QTHR. Tel 01-460 3852.

UK101, upgraded, 32k ram, cegmon, toolkit, Basic 5, new Basic 4, mini eprom board, floppy disc interface, offers. G8FEI, QTHR Bromley. Tel 01-462 6009.

FT101Z, immac cond, new bands, fan, mic, £475 ono. AM high band Westminster, £30. Low band fm Westminster with 4m xtals, £60. TRS80 pocket computer, interface, personal finance program incl, £50 ono. G6CJX NOT QTHR. Tel 021-360 0408.

Radio Amateur Callbooks, 1982 edition, both USA and DX listings, comp with March, June, September supplements, £9 each or offers. Fred Hall, G3NSY, QTHR. Tel 0743790 457.

FT707 and FP707, FC707, boxed as new, £475. G4OYC, Paignton, Devon. Tel 521299.

Trio TS820 hf tx/rx, 160-10m, vgc, box, manual, £425. G4IAR, QTHR. Tel Loughborough 217655.

Sony ICF2001 pll synthesized rx, 150kHz-30MHz, a.m./ssb, 76-108MHz, fm, auto scan memory, boxed, all extras, as new, £110 ono. G4OIZ. Tel 0532 677054, after 6pm.

TRS80 Mod 3 business system; line printer 4; 64k shuffleboard cpm, (current hardware cost £2,300); Super Scripsit, Visical, Profile, Wordstar, 50 disks crammed with software, offers. Sansui D100 stereo cassette deck, metal tape, immac cond, £75. G4IAC, QTHR. Tel 06755 2745.

New QTH forces sale: Cushcraft 10-15-20 motorized halfwave vertical, control box, 3dB gain, unused, halfprice, £100. G4MH Minibeam, AR40 rotator, used six months, perfect, £90. Both boxed, manuals, collect or carriage. G3YYI, QTHR. Tel Tyneside (0632) 383050.

Standard C58 2m multimode portable, £215. Standard C78 70cm fm portable, £200. Matching 10W linear, CPB78, £50. Both comp, scanning mic, case, mobile bracket, Drake SP75 speech processor, £75. Drake 7077 desk mic, £25. East, G4IOF, QTHR. Tel 01-486 8286.

Katsumi twin paddle electronic keyer MK1024, 6-60wpm ac/dc, four memories, bought new Leicester, Joymatch 3A atu, £5. MFJ SBF2 ssb audio filter, £5. SX200N, £200 or straight swop for TS700G, FDK750E, Trio R1000 rx, terminals for long wire, SO250 etc, clock timer, 2-30m. G4IAV, QTHR. Tel 0942 870954.

FT227R 2m fm tx/rx, manual, mobile mount, vgc, £140. G8JBK, QTHR. Tel Colchester 241032.

Icom IC251E 2m multimode, tx/rx, base station, mint, £425. Icom ICSM5 desk mic, Icom ICHM10 fist scanning mic, offers. Daiwa RM940 infra-red mic, no connections, £30. G4MH triband minibeam, coaxial fitted, as new, £55. G4IOF, QTHR. Tel 01-486 8286.

Pye F460 uhf base station, unmodified, could suit 70cm repeater group, £50. Storno Viscount CQM 19/25 mobile, xtalled S20, control box, circuit, £20. Storno Viscount, as above, no xtals, £15. DL6SW 2m fet converter, i.f. 28-30MHz, £10. Heathkit RF1V sig gen, 100kHz-200MHz, £15. Advance constant voltage transformer, input 190-260V, output 230V, 150W, £15. Collins mechanical filter F455Z, 58V2, ssb, £5. SEI quartz xtal 1MHz B7G glass, £2. ITT xtal filter, 455/LQV/901C 10·7MHz, 12·5kHz bandwidth, £3 each. Dubilier capacitors, 8mF 1,000V paper, £1 each. Quartz xtals, mainly HC6U, 9606·4, 10536·2, 11191·6, 14100, 14102, 14104, 14106, 14108, 16024, 16027, 16029, 16032, 16034, 27,000kHz, 50p each. Quantity of transformers and components. G8CUG, QTHR. Tel Byfleet (Surrey) 45859.

Selabs 1088 vdu, solid state keyboard, memory, edit fac, A-N display, ASCII compatible, Printicon tube, 64CHRS per line, 17 lines, serial output (via modem), fan cooling, comp with manual £75. Collect Devon. G3MSV, QTHR. Tel 0395 68259.

Yaesu FT107M, black front, new bands, FP107E pll, as new, £570 ono. Drake TR4C, MS4 spkr, AC4 pll, exc cond, £300. Leak stereo 20 power amplifier, preamp, any offers. G4IZG, QTHR. Tel 0903 41109.

Mast: 6ft 1·5in steel relay, Eddystone dials, xtals, 10/15/20m xtal holders, 160m long wire, lp filter, ant input box, oddments CA81 S-tags, fuses, OG64 on/off switches, J-plugs, indicator light, Japanese BM3 desk mic, £20. Antenna switch. G3XWV, 13 Grimpits Lane, Birmingham 38. Tel 0564 822280.

Trio TR9500 70cm multimode, good cond, only used base station, together with BO9 base, £330. G6AGT. Tel Moore (nr Warrington) 295, evenings.

2m λ/4 whip, gutter mount, feeder, connector, £4. Garex modulator OC35 outputs, suit QQVO310,

3-20A, on chassis, circuit, £4. Transformer, 230-6V, 18A, £5. Minimitter mobile control box, switching, meter, £3. G3MBL, QTHR. Tel 01-445 4321.

TRS80 micro computer vdu, expansion interface, 16k level 2, lower case conversion, numeric keypad, full size keyboard, fitted covers, cassette, loads and loads of software instructions, etc, exc cond. FT107S, offers around £425 each. G6IRP NOT QTHR. Tel Crayford 56341.

HF linear bits for 1kW, incl two 4CX250Bs, bases, psu, tank circuit, etc, £60. FT101 Mk2, LLL clipper, FV101 vfo, £300. G3NMZ, QTHR. Tel Luton (0582) 591749.

Yaesu FRG7, as new, used a few hours only, mint cond, no mods, £150. G6NGZ. Tel Horsham 63965.

Liner 2 2m ssb tx/rx, fitted preamp, vgc, mic, mounting bracket, £75. G8TRE NOT QTHR. Tel Oxford 778188.

Manuals: IC202, FRDX400, Wilcox-Gay master osc, xtal multiplier, Trio KA2000A stereo, Sony KV1810UB Mk1 colour, £2.50 each. Filter unit type 504, 34-86MHz digital, £3. KW2000 etc, three-gang preselector tuner, £4. G3MBL, QTHR. Tel 01-445 4321 (North London).

Trio R1000 communications rx, Global AT1000 atu, both mint cond, £225. G6HFX, QTHR. Tel 0892 37108.

TS120V, £265. IC260E, £250. Sentinel 100W 2m linear, £65. All in good cond. G3XHY, QTHR. Tel 021-777 3563.

IC202S sideband portable, 144·0-144·4, beacons, satellites, xtal for 144·4-144·6, good cond, £120. TC7 rx, SEM 2m and MM 70cm converters, bandsearcher module, good on fm, useless on ssb! £40. G8ADD, QTHR. Tel Brian, 021-748 5268.

Dymar 880 3ch tx/rx, antenna, carrying strap, spkr/mic, nicad battery pack, all in good cond, wkg on 88-108MHz, will convert to 2m, £30. J. Burn, ARS46787, 7 Atkinson Street, Haverigg, Millom, Cumbria LA18 4HA. Tel Millom 2533, after 6pm.

Will swap the following: Eumig C3M 8mm camera turret head, pistol grip, filters, and matie box etc, leather case, Bell & Howell Super 8 film sound projector model 428, Omega watch, Seamaster 30, stainless steel case and bracelet, new in maker's box, ticket attached. *Wanted:* Heathkit SB401 and SB303 or first class communication receiver. GM2DWW, 87 Ardenslate Road, Kirn Dunoon, Argyll, Scotland.

FT101E, dc power lead, ac power lead, mic, box, etc, used for transverting only, spare set of pa valves, £325. G6MBS. Tel Alsager (South Cheshire) 3879, after 6.30pm.

LS707 Belcom 70cm multimode and psu, SOTA 50W linear, offers? FT707, £360. FRG7, very many mods, incl mech filter, £110. G3KEF. Tel 0279 413070.

Trio 9R59D gen cov rx, £40. Azden PCS3000 2m mobile, three months old, £170. Ferrograph Series 5 tape recorder, unmarked, £35. Offers considered for any of above. *Wanted:* FT101ZD a.m./fm, spot cash waiting for Mk2/3 tx/rx. Tel Lye 7838 (West Midlands).

Ferrograph Series Six, Y632 stereo tape recorder, immac, heads unworn, approx 10h use since manufactured, £48 ono. *Wanted:* MML432/50 70cm 10W in, 50W out, linear or similar. G8CXV, QTHR. Tel Nottingham 384956, after 5pm.

Yaesu FRG7000 in mint cond, boxed few hours use only, £195 or exchange for micro computer with cash either way. G3RGJ, QTHR. Tel Parkstone (Dorset) 742142.

Detached bungalow, three beds, games room, lounge, kitchen, bathroom, separate wc, integral garage, large garden, full gas ch, some double glazing, semi-rural situation, 4 miles Leigh, 5 miles Bolton/Wigan, near M6, M61, M62, good vhf site, planning permission, 60ft tower, carpets included, garden shed/shack, reduced to £33,500. G4IAV, QTHR. Tel 0942 870954.

Icom IC2E 140-150MHz, good cond, spare nicad pack, spkr mic, 12V adapter, pack, mobile charging lead, nicad charger, comp with orig packing, manuals etc, £150 ono. G6ESE, QTHR. Tel 061-626 1618, after 6pm.

WANTED

Will exchange as new FRG7000 in orig packing for Collins 75A4 or Racal R17L. Butler, 14 Willow Park, Queensferry, Clwyd.

FT221 or FT225, QQ640 valve, 4CX250 valve, base, chimney, 70cm transverter or accessories, suitable FT707. Hamvision sstv monitor or similar. Will travel to view. Jim Atkinson, GM6HWY, 2 Ardgowan Place, Main Street, Inverkip. Tel 0475 84333, day, 0475 521661, evenings.

Welz AC38M or Amtech 200B or 300B or similar, cheap. 29 Elmlea Drive, Olney, Bucks MK46 5HU. Tel Bedford (0234) 711865.

For the Wireless Museum: old radio books, magazines, catalogues, service sheets, QSL cards, Gamages catalogue, valves, morse keys, components, knobs! Eight-track cartridge player, Tractrix horn, B40 info. Collection arranged. Details please to hon curator, G3KPO, QTHR. Tel Ryde 62513.

Trio spkr type SP520, Trio TS520 workshop manual, either purchase or loan for copying, all expenses met. HQ1 minibeam, must be mechanically sound, heater transformer for 2X813, 10V at 10A, must be compact. Tel Codsall 3134.

Mains transformer(s) to give 800V, 200V, −60V, 6·3V, 24V dc output, or old psu from KW or Marconi tx, etc. HC6V xtals (1·35 to 13·0MHz). G4GCB. Tel Belper (Derbys) 6851.

Radio & Television Servicing Handbooks 1970-1, 1973-4, 1974-5, 1975-6, 1977-8, 1979-80, in good cond. GW6KZU, QTHR. Tel 0407 741702.

Dealer sought! Can anyone who went to the BARTG Rally, Esher, summer '82, tell me which company was selling Bandridge lightweight stereo headphones (MH12)? I want some more!! P. Morgan, 21 Trafalgar Road, Portslade, Brighton BN4 1LD.

SSB filter HW101 type 404-328, new or ex-equipment. John Carter, G3KYH, 20 South Terrace, Surbiton, Surrey. Tel 01-399 6160.

Heathkit tx SB400 or SB401, urgently. Must be in good cond. State price. G3JMR, QTHR. Tel 0922 30119.

Heathkit tx DX40U, mains transformer, unserviceable DX40U considered providing mains transformer is in good cond. Screening cover for rf section (tuning) on AR88. G3UNB, QTHR. Tel Fareham 236095.

SP400 or similar, to suit FTDX560 or FRDX400. Will collect. G4LMA. Tel John, Telford 49306.

Handheld synthesized 2m rig, like FT207R or IC2E. Kelman, 61 The Fairway, Oadby, Leicester.

Trio PS30 ac power supply. G4JQO, QTHR. Tel King's Lynn (0553) 840401.

Radar tr unit for Decca Super 101 or EMI Electra Scan Mk1. G4EZM NOT QTHR, c/o G8OZE. Tel Blackpool 64836, after 6pm.

JRC NRD515 rx, in new mint cond, will exchange for my new in January and unused Icom IC740 100W hf rig with IC740PS, internal mains psu, boxed, as purchased or w.h.y? G3SPJ, QTHR. Tel Colin, 01-311 8405.

HQ1 beam and rotator, both must be in good cond and not old and defective. Pamphlet relating to rotator appreciated. G6WU, QTHR. Tel 01-886 8858 (London, Southgate N14 5HP).

For sentimental reasons: CR100, must be clean and repairable if not wkg. Good price paid for right model. G3EGC, QTHR. Tel Bolton (0204) 51502.

Circuits, information, manuals, mods, to buy, borrow, photostat, for Heathkit IO12U scope, Heathkit S3U beam splitter, Standard 5AH/B46 tx/rx, Pye PF1 tx/rx, Advance J1 sig gen. G3LBS, QTHR. Tel Wythall (0564) 826072, or Lyndon School, Daylesford Road, Solihull, West Midlands B92 8EJ, tel 021-743 3402.

Icom ICRM3, remote control for IC211E. Price etc to G6JFJ, QTHR. Tel 0482 853276.

Whaddon Mk15 or Mk7, BMK2, AMK3. Good price for complete set. G3NYE, QTHR. Tel 061-863 6263, between 8am and 4pm.

Datong FL2, speech processor, cheap 70cm handheld (not PF1). Anthony Richards, GW4RYK, Castell Forwyn, Abermule, Powys. Tel Abermule 255.

Good 444, can collect, or similar. Circuit diagram or any info on Eddystone 730/4. G4ILR NOT QTHR. Tel Cromer 761612.

Canadian reception set type VRL. R107 in perfect cond. R106. G4GEN, QTHR. Tel 082571 2205.

Ex-Post Office morse key type 610, large knob. Morse key, Bakelite case sloping front, lift-off cover, ex-RAF (not type D, but similar) 1940-45 era, ref No unknown. GW4JKR, QTHR. Tel 715582.

Fluke 8200A dvm resistance board. ZC39 or equiv metalwork 70cm 4CX250B pa supplied by this advertiser 8yr ago. *For sale:* WA9HUV/DF5QV precision made 13cm pa/mixer cavity, £40. 23cm interdigital filter, £20. G3VVB, QTHR. Tel Mevagissey 842368.

1,296 valve linear, 1,296 from/to 144 transverter, w.h.y? P.L. Crosland, Red Lion Cottage, Holt Heath, Worcester. Tel 0384 238101, day, 0905 620041, home.

National SW54 valve swl rx from about 1960. G5DDC. Tel 01-486 4137.

Pre-1930 radio items: xtal sets, wireless rxs, horn spkrs, wireless magazines and books. Pre-war televisions and literature. G4OGT. Tel 01-660 2240, evenings only.

Parmeko mains transformer model NV6000/81. AP67381. G3RGR, QTHR. Tel 0252 27656.

TR2500 for cash, collection arranged. *For sale:* new valves, sae with requirements. M. Twigg, 30 Valley Drive, Yarm-on-Tees, Cleveland TS15 9JQ.

Yaesu FT101, E or B, model E preferred, must be in good cond, preferably in south Devon area, so I can inspect. Tel Albert, Ivybridge (07554) 2012.

Really good roller coaster coil unit. Vacuum variable tuning capacitors. Your price paid for first rate items. GM3WTA, QTHR.

Can anyone give me any gen on the Ekco ZU4 66RH 826 decoder. It has a cassette deck and 12in turntable for lps. Will refund any cost involved in receiving. Mr N. A. G. Mortimore, 62 Ashbourne Road, Mitcham, Surrey CR4 2BA.

VFO for Yaesu FT75. Heath power supply, suitable SB101 or HT32. G3LYK, QTHR.

Would like to exchange a Bell & Howell 8mm 674/XL cine camera, projector, editor and splicer in mint cond for an FRG7700 or similar. James McKnight, 4 Dunkitterick Drive, Newton Stewart, Wigtownshire. Tel 0671 2056, after 6pm.

QY4-400 bases and top caps. 5V 30A transformer, 2in or larger ceramic coil formers. PW Helford, built and working, or unfinished, well built unit up to pa driver stage. 160 transverter. G3YCP, QTHR Somerset.

Coil units for 46 set; 38 set Mk1, Mk3, canvas cases for 38Mk2, A510, 88 set, 46 set, metal case for 18, 48 sets, blade antenna for PRC6, morse key for A510, B44 Mk2. Any Larkspur range. G8MQT, QTHR. Tel Terry, 07073 27233.

Eddystone all world two rx. Eddystone click stop band set capacitor, band spread 14pF capacitor. MCR1 miniature comms rx. *For sale:* various pre-war rxs. G4HHZ, QTHR. Tel Chandlers Ford (04215) 68705, home, Winchester (0962) 822401, work.

Solotran plug-in amplifier, dual trace type CX1252, with or without input attenuator. Any information on EMI oscilloscope type WM1. Yaesu FT7 or FT7B less power supply. G2BCY, QTHR. Tel Newcastle on Tyne (0632) 654780.

Enthusiast requires AR88 or similar surplus rx such as HRO BC342, BC348. Handbooks/manuals for above. I. Pordum, 56 Gowland Avenue, Newcastle on Tyne NE4 9EP. Tel 0632 735320.

KW Vespa Mk2. Manual. Reasonable reach Abingdon, Oxon. G2ACB, QTHR. Tel Longworth 820332.

Trio PS6 power supply. Newnes books: *Short Wave Handbook; Wireless Transmission for Amateurs;* both by Camm. Eddystone short wave manuals. Roberts, GW6AYM, QTHR. Tel Swansea (0792) 204146, evenings.

FT75 or FT75B, with mains, mobile psus. *For sale:* FT101E, matching FL2100B linear, both mint, cables, manuals, orig cartons, £600. G3WIF, QTHR. Tel Bristol (0272) 293738.

Power amplifier for FT290, two types: low power MML 144/30 or similar; high power MML 144/100 or similar. RTTY equipment. Tel Collins, 01-579 9455.

HW8 or HW7 in good cond. Purchase or exchange for HW12A 80m ssb rig with psu, or DX40U with vfo (may need slight attention). Tel Lucien, 01-958 9868, after 6pm.

2m multimode mobile tx/rx, swop Commodore VIC20 computer, 3k ram-pack, C2N cassette deck, cash adjustment. G6NZQ, QTHR. Tel Witney (0993) 75337.

Old slow motion dials, Burndept or Igranic pre-1930 pattern. Pre-1933 mags and books. Pre-1930 baseboard mounting condensers. TCC or Dubillier. *For sale:* National NC173 vintage gc rx, xtal filter, new valves, etc, good cw rx, haggle around £30. W.H.Y? G3SSJ, QTHR. Tel 01-627 33816.

Can you help please? Handbook or photocopy of Sommerkamp TXFL200B lin FL1000. Headset for my A510 (this is the one with trumpet mic to earpiece). G4PYD. Tel Colin, Grimsby 824371, after 6pm.

BXI two-section telescopic tilt-over tower, prop-pitch motor, Selsyn indicators, TA33 Yagi with balun. G3UFZ NOT QTHR. Tel Churston (0803) 845304.

HW8 and psu, no mods. Codar AT5 and psu, no mods. G3LP, QTHR. Tel 0242 512481.

Antenna Theory and Design by H. P. Williams. Antenna books by Kraus or La Port. HF or airband handie-talkie, walkie-talkie or w.h.y? Wayne Kerr bridge suitable antennas. G4OXM, 19 Oxford Road, Middlesbrough, Cleveland TS5 5DY. Tel 0642 819922.

Information and advice leading to the capture of long persistence CRT DP732 or its equivalent for slow scan project. Any data regarding this tube would be very much appreciated. Mick, G4PRJ, Flat 4, The Square, Wilderness Road, Guildford, Surrey.

For xyl of G4KGT: amateur bands rx (she can't beat us so she's decided to join us!). Nothing too sophisticated, price range say £30 to £50. G4KGT. Tel John, 01-920 8142, or 02406 4380.

RTTY strobe tuning forks, 125VPS and 91VPS, gen cov rx RA117E or later model. R390A or later model. Must be to pro spec or similar equipment. Details to GM4AGS, QTHR. Tel 0382 543113.

£10 reward for information leading to purchase of pedal generator, 1945 vintage, tripod tubular frame with rectangular back-frame and canvas deckchair seat. Square housing generator has five-pin Plessey connector, webbing straps and canvas cover. G3EUR, QTHR. Tel South Ockendon 852371.

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

Appointed Stockists of Trio, Yaesu & Icom.

24hr DELIVERY AVAILABLE

Send SAE for latest copy of our catalogue.

FDK THE NUMBER ONE FM RIG—RUGGED & RELIABLE!

M700AX NEW

- Full coverage of 144 to 148 MHz in 5kHz steps
- Concentric frequency control selectors—"aircraft style"
- Full 25 watts power output continuously variable down to 1 watt
- Receiver sensitivity better than 0·3μv for 20dB
- Single channel memory frequency instantly programmable
- 1750Hz tone-burst, 600kHz repeater shift, reverse repeater
- Large LED display and illuminated meter
- Complete with mic, mounting brackets, DC leads etc.

£215!

Carriage free

SUPER BUY

FULL FACTORY WARRANTY

ASK FOR WRITTEN CREDIT DETAILS

FDK 2M ALL MODES—NOW EVEN GREATER VALUE

M750X NEW

- Full coverage 144-148MHz in 5kHz and 100Hz steps
- High quality USB, LSB, CW, FM for base or mobile
- Power output 10 watts switchable 1 watt on all modes
- Receiver sensitivity better than 0·3μv/20dB and 0·15μv/10dB
- Dual programmable VFO's, 600kHz shift, automatic tone burst
- Automatic scanning and up/down frequency microphone control
- Complete with mic, mounting brackets and DC leads, etc

£315!

Carriage free

SUPER BUY

FULL FACTORY WARRANTY

NEW AIRBAND BASE/MOBILE MONITOR

CD-6000

£99

Carriage £1.50

- 110MHz-139·995MHz in 5kHz steps
- Covers all AM channels including beacons
- Clear LED digital readout display
- Sensitivity better than 0·5μv for 10dB
- 12v DC power requirement. 400mA
- Automatic scanning facility. Built in speaker
- Complete with mobile mounting bracket and DC cable

NEW FDK ATC720 AIRCRAFT MONITOR

- 118-136MHz AM portable aircraft monitor
- 25kHz steps controlled by thumbwheel switch
- Sensitivity better than 1 microvolt
- Internal long lasting rechargeable ni-cad battery pack
- Plug in helical whip and external earpiece socket
- Auto tracking front-end tuning for good image rejection
- Supplied complete with AC charger and aerial

£129

plus free list of UK airband frequencies.

POSSIBLY THE MOST ADVANCED FM TRANSCEIVER ON THE MARKET! AZDEN PCS-4000

AN INCREDIBLE SPECIFICATION—ULTRA SENSITIVE—HIGH POWER

Feature:—

- Ultra compact size measuring a tiny 2" × 5½" × 6½". Ideal for the modern car.
- Frequency coverage 144-146MHz in a choice of either 12½ or 25kHz steps.
- Microcomputer type keyboard offering sophisticated frequency control and back lighted for night operation.
- 16 memories in dual banks with frequency offset storage facility. Memory 1 in each bank may be recalled instantly.
- Remote control microphone with priority memory call.
- Comprehensive scanning facility. One or both memory banks may be scanned. In addition each 1MHz segement can be scanned or upper and lower limits may be set within that 1MHz segment all with 5 second pause.
- High power output of 25 watts with 5 watts low power position.
- Super receiver front end with better than 0.2uv for 20dB quieting. Comprehensive bandpass circuitry.
- Rugged modular assembly assuring many years of reliable service.

£229

SEND FOR COLOUR LEAFLET.

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

WELZ®

"DIAMOND" RANGE OF ANTENNAS

GH22
BASE ANT
144 MHz
2 × 5/8th wave
6·5dB gain
£27.95
Power 100 watts
Height 2·7m
Wind 25m/sec
Weight 0·9Kg
Mast clamp 25·50mm
SO239 connector

Carriage charge on all aerials—£3.75

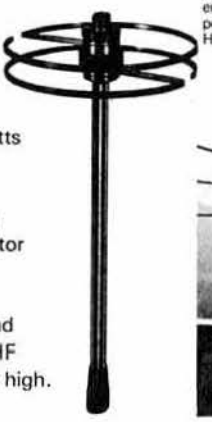
Carriage on accessories ordered separately—£1.50

B285
BASE ANT
144 MHz
1 × 5/8th wave
3·4dB gain
£14.95
Power 100 watts
Height 1·3m
Wind 35m/sec
Weight 0·75Kg
Mast clamp 25·50mm
SO239 connector

M285
MOBILE ANT
144 MHz
5/8th wave
3·4dB gain
£8.50
Power 100 watts
Height 1·3m
Tapered whip
Fold over base
PL259 connector

M287
MOBILE ANT
144 MHz
7/8th wave
4·5dB gain
£14.95
Power 100 watts
Height 1·8m
Tapered whip
Fold over base
PL259 connector

DP-LOR

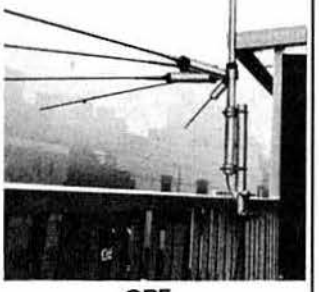


DP-LOR
Elevated ground plane for all VHF models 0·35m high.
£17.95

NEW!
5 BAND
Compact Vertical
10-80M 200W
"A vast improvement over its competitors"

A new exciting product from Welz. The CP5 is a truly superb 5 band aerial system where space is at a premium. Capacity loading and individually tuned radials ensure maximum performance and bandwidth. Height 14ft. approx.

£115



CP5

GLS

MB

Carriage on all Welz power meters is free

Model No	Description	Price
DP100S	5 band HF mobile with telescopic base	£79.95
LBR	Heavy duty base spring to DP100S	£10.50
BDS	Bumper mounting strap for DP100S	£9.50
EL40	40m base loaded whip 2·45m PL259 con	£32.50
EL80	80m base loaded whip 2·48m PL259 con	£37.00
GLS	Gutter mount (SO239) with 5m cable	£8.95
MB	Deluxe magnetic base (SO239) with 5m cable	£12.95
TRB	Heavy duty trunk lip mount (SO239)	£11.50
KB105	80-10m vert 1kW 7m high	£79.00
KB101	40-10m vert 1kW 5m high	£54.00
CP5	80-10m compact vertical with radials 200 watts	£115.00

JOIN THE HUNDREDS OF WELZ USERS AND EXPERIENCE "PERFORMANCE"

WELZ DELUXE POWER METERS

SP600	1·8-500 MHz 2kW (HF) 200 watts VHF/UHF 3 power levels 0-20, 200 or 2000 watts 3 ant inputs	£97.00
SP300	1·8-500 MHz 1kW (HF) 200 watts VHF/UHF 3 power levels 0-20, 200 or 2000 watts 3 ant inputs	£97.00
SP200	1·8-160 MHz 0-20, 200, 1000 watts 2 ant inputs	£69.95
SP400	130-500 MHz 0-5, 20, 150 watts N connectors	£69.95

WELZ SP10X

1·8-150 MHz
20/200 watts
VSWR and power
50 ohm/SO239
Sens = 3 Watts
Pocket size
Ideal for mobile

£21.95

WELZ CH20 COAX SWITCH

Performance coaxial switch
1 input and 2 outputs
DC-900MHz 0·1dB
Isolation 50-70dB
VSWR 1:1 Power 1kW
Coaxial cavity
Gold plated contacts

£17.95

WELZ SP15M POWER METER

1·8-150 MHz Flat
2·5/20/20 Watts
VSWR and power measurements
50 ohm/SO239/0·2dB
VSWR sensitivity - 1·5 Watts
Large, easy to read meter
Accuracy better than 10%

£35

WELZ AC38 HF ATU

Ideal hf atu
8 bands 3·5-29·7 MHz
Power rating 200W CW 400W PEP
Input 50 ohm SO239
Output 20-300 ohm unbalanced
Insertion loss 0·5dB
Matches all modern transceivers

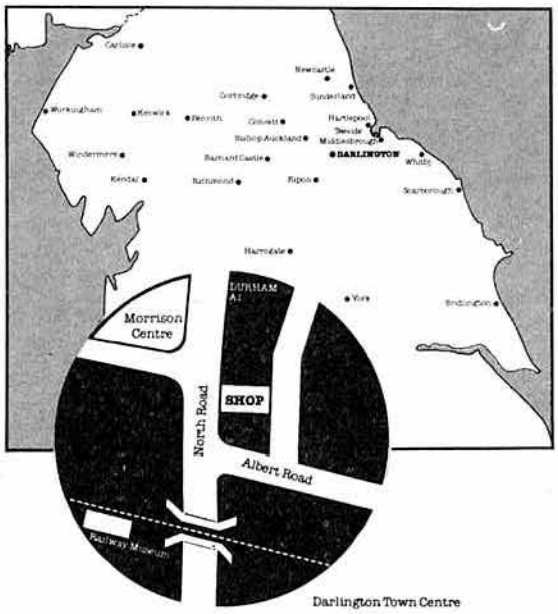
£65

SP10X

CH20A

LOWE ELECTRONICS

IN THE NORTH EAST



A huge free car park, a shopping complex which has within it a large supermarket, a wine and spirits shop, a bistro restaurant and convenient banking facilities has nothing at all to do with amateur radio.

However, as all these facilities are to be found across the road from our new amateur radio shop in the North East of England, then you will appreciate that we take great care in positioning the Lowe Electronic shops to help both you and other members of your family. The shop is in Darlington, 56 North Road, that is on the A167 road to Durham, only a few minutes from the town centre. Darlington is a delightful market town with extremely good links to the A1 north or south and to the west and east. Indeed, Darlington is easy to get to from towns such as Scarborough, Bridlington, York, Harrogate, Penrith and Carlisle. To the fortunate Radio Amateurs of the North East, then you have Lowe Electronics in your own backyard.

A Lowe Electronics' shop means the opportunity to browse, to try out, without sales pressure, a new or second hand piece of equipment before you buy it. And not only that, the shop will stock all the usual accessories, aerials, swr meters, cables, rotators, tuning units, plugs, sockets, etc. All equipment bought from the Darlington shop will carry the now well-known Lowe after sales service. It is a fact that today's equipment, although very reliable, is extremely complex and although not beyond the amateur, the expensive test equipment required for the repair leave most of us in the hands of the person who sold us the rig.

With Lowe Electronics not only are the hands helpful but technically able.

MATLOCK 0629 2817, 2430, 4057, 4995
LONDON 01 837 6702
GLASGOW 041 945 2626

For Details regarding Darlington opening date ring us here at Matlock

BRAND NEW COMPONENTS BY RETURN OF POST

VAT Inclusive Postage 15p (Free over £5). List Free

HIGH STABILITY MINIATURE FILM RESISTORS 5% Tolerance
¼W E24 Series 0·51R–10MO. (Except 7M5) **1p**
0·125W E12 Series 10R to 1M8. **2p**
0·5W E12 Series 1R0 to 1MO. **1½p**
1·0W E12 Series 10R to 10MO. **5p**
¼W Metal Film E12 series 10R to 1MO. 5% **2p**, 1%. **3p**

Mullard or equivalent Subminiature Ceramic Plate capacitors 100V E12 Series
2% 1·8pf to 47pf **3p**. 2% 56pf to 330pf **4p**. 10% 390pf to 4700pf **4p**

Plate Ceramic Capacitors 50V working for vertical mounting
E12 Series from 22pf to 1000pf then E6 series 1k 5pf to 47k pf. **2p**

Miniature Polyester capacitors 250V working for vertical mounting
·01, ·015, ·022, ·033, ·047, ·068 **4p**. 0·1 **5p**. 0·15 & 0·22 **6p**
0·33 & 0·47 **8p**. 0·68 (63V) **11p**. 1·0 **15p**. 1·5 **20p**. 2·2 **22p**

ELECTROLYTICS Wire Ended (Mfds/Volts)

·47/50 **5p**	10/50 **5p**	47/16 **6p**	100/25 **7p**	220/25 **8p**	470/40 **16p**
1·0/50 **5p**	22/16 **6p**	47/25 **6p**	100/50 **8p**	220/50 **10p**	1000/15 **15p**
2·2/50 **5p**	22/25 **6p**	47/50 **6p**	150/16 **7p**	470/16 **11p**	1000/25 **25p**
4·7/50 **5p**	22/50 **6p**	100/16 **7p**	220/16 **8p**	470/25 **11p**	1000/40 **35p**

TAG ENDED CANS: 3300/25V **40p** 4700/16 **25p**. 2500+2500/63 **£1.00**.

TANTALUM BEAD ELECTROLYTICS Subminiature vertical Mounting (Mfds/Volts)

0·1/35 **14p**	2·2/35 **15p**	15/16 **20p**	22/16 **30p**	47/16 **80p**
0·22/35 **14p**	4·7/6 **14p**	15/25 **35p**	22/25 **35p**	68/3 **30p**
0·47/35 **14p**	4·7/25 **15p**	22/6 **20p**	33/10 **30p**	100/3 **35p**
1·0/35 **14p**	10/25 **29p**	22/10 **25p**	47·6 **30p**	200/16 **£1.20**

POLYSTYRENE Capacitors 63V working E12 Series Long Axial Wires
10pf to 820pf **3p** 1kpf to 10kpf **4p** 12kpf **5p**

TRANSISTORS

BC107/8/9 **12p**	BC547C/8C/9C **7p**	BC212L **8p**	BFY50/51/52 **20p**	BFX88 **25p**
BC147/8/9 **10p**	BC557C/58C/9C **7p**	BCY70 **15p**	2N2926 **7p**	BSX19&20 **15p**
BC157/8/9 **10p**	BC182L,184L **8p**	BF195&7 **10p**	2N3055 **50p**	BD135&6 **25p**

8 pin i.c.s. 741 **18p** 555 **24p** Holders 8 pin **9p** 14 pin **12p** 16 pin **14p** 28 pin **25p** 40 pin **40p**

DIODES (p.i.v./amps)

75/25mA 1N4148 **2p**	800/1A 1N4006 **6p**	400/3A 1N5404 **14p**	115/15mA OA91 **6p**
100/1A 1N4002 **4p**	1000/1A 1N4007 **7p**	60/1·5a S1M1 **5p**	100/1A Bridge **25p**
400/1A 1N4004 **5p**	1250/1A BY127 **10p**	30/45mA OA90 **6p**	30/150mA AAY32 **12p**

Zener Diodes E24 series 400mW. 3V3 to 33V to 33V **8p**. 1 watt 3V9 to 33V **12p**
LEDs 5 & 5mm. Red **10p**. Green & Yellow **14p**. Grommets 3mm **1½p**. 5mm **2p**
Fuses 20mm glass 100mA to 5A. Q Blow **5p**. A/Surge **8p**. Holders **5p**. (p.c. or chassis)

The C.R. Supply Co, 127 Chesterfield Rd, Sheffield S8 0RN. Tel: 57771

Some still in use after 30 years –THAT'S RELIABILITY!

Mustang	3 elements, 10 15 and 20 metres	£192.00
TA-33 Jr.	3 elements 10, 15 and 20 metres	£154.00
TA32 Jr.	2 elements, 10 15 and 20 metres	£103.00
TA31 Jr.	Rotary dipole, 10, 15 and 20 metres	£60.00
ELAN	3 elements, 10 and 15 metres	£110.00
TD-2	Trap Dipole 40 and 80 metres	£49.00
TD-3 Jr.	Trap Dipole 10, 15 and 20 metres	£38.00
TGD-2	Trap Dipole 40 and 80 metres compressed	£60.00
V-3 Jr.	Trap Vertical 10, 15 and 20 metres	£44.00
Atlas	Trap Vertical, 10, 15, 20 and 40 metres	£70.00
SWL-7	Dipole 11, 13, 16, 19, 25, 31 and 49 metres	£42.00
RD-5	Dipole 10, 15, 20, 40 and 80 metres	£42.00
Orbit	Vertical 11, 13, 16, 19, 25, 31 and 49 metres	£56.00

MOSLEY

Send for HANDBOOK containing a full range of Antennas and technical information, 28 pages £1.00. Refundable upon purchase of Antennas.

Appointed Dealer Strumech Towers All spares available

MOSLEY ELECTRONICS LIMITED
196 Norwich Road, New Costessey, Norwich NR5 0EX
Administrative Address only
(All antennas available ex works, carriage and VAT extra)

Pye Base Station Receiver **F27 AM** Crystaled on 116.46MHz, can be recrystaled on Air Band, unused condition **£15** each plus £5 p.p. plus VAT. **Pye AC200** Mains Power Unit for Olympic or Reporter, Automatic standby power facility with trickle charging & built-in quartz digital clock. **£95** each plus £5 p.p. plus VAT. Pye AC Power Unit **AC25PU**, specially designed for use with the 'Europa' series mobiles, power output 13.2v @ 5amp. Unused condition **£45** each plus £5 p.p. plus VAT. Pye **PC1** Radiotelephone Controller, good condition, 2 only at **£50** each plus £2 p.p. plus VAT. Pye **Tulip Microphone** as used with most Base Stations & PC1, 2400ohm with PTT switch. **£15** plus £1 p.p. Plus VAT. **Pye PF1** UHF FM Pocketfone Receivers 460MHz, single channel, int. spk. & aerial. Requires 9v battery with service manual **£6** each plus £1 p.p. plus VAT. **Pye PF2** Pocketfones All types available AM, FM, UHF. Complete with battery, make & aerial. **£65** plus £2 p.p. plus VAT. Pye PF1 Pocketfone Battery Charger Type **BC14**, 12 way with meter **£10** each plus £1 p.p. plus VAT. Pye **PF5012** UHF Handhelds crystaled on 466MHz complete with Ni-Cad Battery. **£140** plus £2 p.p. plus VAT. Pye Vanguard/Cambridge control leads, 18 way with plug & socket fitted. Unused **£4** plus £1 p.p. plus VAT. **Marconi** AM/FM Signal Generator Type **TF995A/3/S (CT402)** 1.5-220MHz with copy of manual **£95** plus £15 p.p. plus VAT. **Avo** Valve Tester Type **CT160** (22 valve bases) with copy of manual **£24** plus £6 p.p. plus VAT. Mains Isolating Transformers 500 VA 240v input, 240v C.T. output housed in metal box. **£15** each plus £6 p.p. plus VAT. 60amp. Alternator & Generator Noise Filters **£1** each plus 50p. p.p. plus VAT. **Modern Telephones Type 746** with dials, colour grey, used but good condition. **£8** plus £1 p.p. plus VAT. **Scopex Oscilloscope Type 4D10**, 10MHz dual beam, used but good condition. **£160** plus £10 p.p. plus VAT.

B. BAMBER ELECTRONICS

GOVERNMENT AND MANUFACTURERS SURPLUS

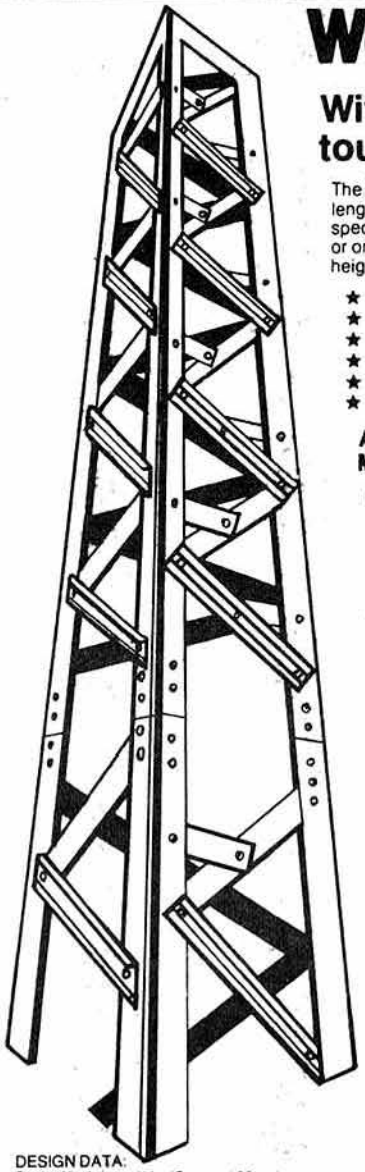
5 STATION ROAD, LITTLEPORT, CAMBS. CB6 1QE
Phone **Ely (0353) 860185**

GW3SSY **AIRCOM of Abergavenny** GW4IHN

THE FRIENDLY EMPORIUM IN A TOURIST TOWN

Plenty for the XYL to do while you browse in stock—rigs and accessories, Microwave Modules, Jaybeam, rotators, etc.

Access and Visa welcome.
22 Brecon Road, Abergavenny, Gwent NP7 5UG. 'Phone 2566



DESIGN DATA:
Basic Wind-speed V=45mps=100mph
Design Wind-speed Vs=49·5mps=110mph
Dynamic Pressure q=·0625Vs²=153Kgpm²

Western have got one up on you!

With the original tough Western ALU-MAST

The ALUMAST is a 15" (375mm) wide triangular cross section lattice sectional aluminium mast based on a 10ft (3.05m) section length. It is supplied "knocked-down" in a tubular carton for ease of transport, but can easily be assembled needing no special tools or skills. The system includes top plate with bearing sleeve, rotor plate and a choice of a fixed base frame (FB-1) or one with hinge joints (HB-1) to enable the mast to be pivoted at ground level. Guy brackets are available for use at heights above 30ft.

- ★ Made from high strength corrosion resistant alloy using WESTERN EXCLUSIVE 'W' section leg extrusions.
- ★ Easy assembly using bolts and "Nyloc locking nuts for security.
- ★ Free-standing to 30ft (9.15m) with a typical tri-bander plus VHF/UHF antennas.
- ★ Heights to 250ft (75m) with appropriate guy configurations (ask us for quotes).
- ★ Lightweights – only 25lb (11kg) per 10ft (3.05m) section.
- ★ 30ft (9.15m) mast is delivered in a tube only 10ft 6in (3.2m) long by 6in (0.126m) dia.

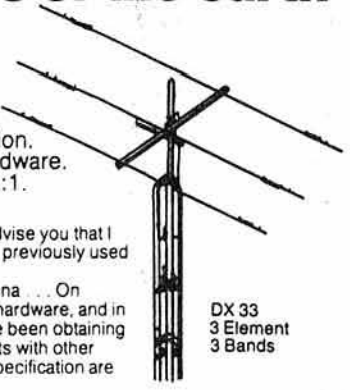
A COMPLETE 30ft (9.15m) MAST for 375/PSS/3; HB-1; RMP-1; TP-1 **£294.40**

FULL PRICE LIST *All prices include carriage and VAT at 15%* *For Scotland — add £10 extra carriage*

375/PSS/3	30ft mast (3 sections)	£227.70	RMP-1	Rotor mounting plate	£13.80
375/PSS/1	Additional 10ft section	£75.90	TP-1	Top plate with sleeve	£14.95
HB-1	Hinged base unit	£37.95	GB-1	Guy brackets (set of 3)	£13.80
FB-1	Fixed base unit	£26.45			

Penetrate the four corners of the earth

DX PENETRATOR



DX 33
3 Element
3 Bands

HERE'S THE SPECIFICATION . . .

- ★ 3 elements on each band.
- ★ heavy duty 2kW rated
- ★ Gain up to 8dB
- ★ Broadband operation.
- ★ Stainless steel hardware.
- ★ SWR less than 1.3:1.

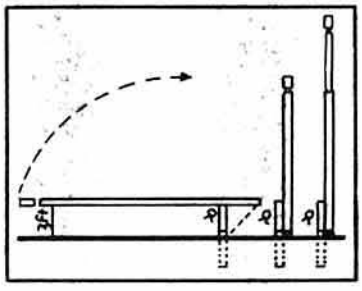
HERE'S WHAT THE CUSTOMERS SAY!

1. VK7NOW "I have recently installed a DX-33 beam and I would like to advise you that I am extremely satisfied with it. It certainly outperforms the TH3JNR which I previously used and also the VSWR is lower."
2. G3AAE "This letter is to tell you how pleased I am with the DX-33 antenna . . . On unpacking the DX-33 I was immediately impressed with the quality of the hardware, and in operation it is just as impressive. I have used it on all three bands and have been obtaining excellent reports from DX stations all over the world. I have conducted tests with other stations and these show that the electrical figures included in the DX-33 specification are fully met in practice. Congratulations on a very fine product!"

HERE'S WHAT WE SAY! BRITISH IS REALLY BEST **£149.50**

PRICES (INC CARR AND VAT) *Current plus VAT paid*

DX-31	Dipole, 2kW, 10-15-20m	£67.85	DX-103	3-element, 10m	£74.75
DX-32	2-element, 2kW, 10-15-20m	£102.35	DX-105	5-element, 10m	£97.75
DX-33	3-element, 2kW, 10-15-20m	£149.50	TD1/10/80	Trapped dipole, 10,40,80m	£45.42
DX-34	4-element, 2kW, 10-15-20m	£212.75	TD1/15/80	Trapped dipole, 15,20,40,80m	£45.42
DX-GV	Vertical 10-80m	£74.75			



THE ULTIMAST

The ULTIMAST is a tubular steel two-section mast which is telescopic and tilt-over. Constructed of two steel tubes – the lower square section and the upper round section – and hot-dip galvanised for corrosion resistance, the ULTIMAST telescopes up to 30ft (9m) and down to 15ft (4.5m). Secured to a square section tubular base post, the mast can be tilted over to only 3ft (1m) above ground for ease of access to antennas. Two head units allow clamping of rotor to 2" (50mm) dia. stub, or internal flat plate mounting.

- ★ Slim and unobtrusive
- ★ One-winch operation
- ★ Simple ground fixing
- ★ Self-supporting
- ★ For HF and VHF antennas

£287.50

Our Ultimast is reviewed in Practical Wireless

A COMPLETE TELESCOPIC TILT-OVERMAST for only UM-1; UHD-2

FULL PRICE LIST

UM-1	Basic mast	£251.85
UHD-2	Reducing head adaptor	£16.10
UHD-2	Rotor head unit	£35.65

Call Western for your YAESU and TRIO requirements. We will not be undercut.

DEALER ENQUIRIES WELCOME

All prices include carriage and VAT at 15%. For Scotland add £10 extra carriage. Ex stock by return.

Western Electronics (UK) ltd

Fairfield Estate, Louth, Lincs, LN11 0JH Tel: Louth (0507) 604955 Telex 56121 WEST G

SPECIAL OFFER

TRS-80 Colour Computer
Ideal for RTTY & SSTV
Send for details

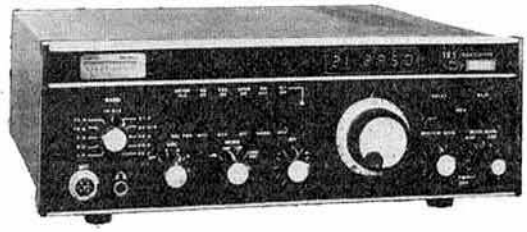
COLLINS KWM-380 Amateur Bands

Transceiver 1.8-30MHz
Receiver 1.8-30MHz
£2195.00

DRAKE TR7A

The Transceiver others try to copy
£1199.00

DRAKE TR5

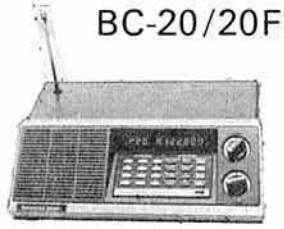


DRAKE's low cost Transceiver
£657.00

BEARCAT SCANNERS

BC-100FB **£345.00**
Hand held 16 channel programmable

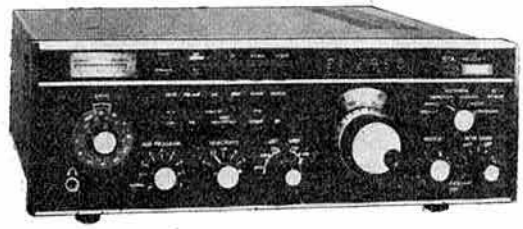
NEW!
BC-20/20FB



40 Channels
AM/FM
£258.75

BC-150FB 10 channel	**£144.90**
BC-250FB 50 channel	**£258.75**

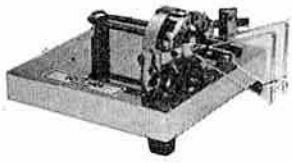
DRAKE R7A



General Coverage Receiver
£1173.00

BENCHER PADDLES

BY-1 Black Base	**£35.84**
BY-2 Chrome Base	**£43.72**
BY-3 Gold plated	**£92.00**
ZA-1A Balun	**£15.00**
ZA-2A Balun	**£17.25**
ZY-2 CW Audio Filter	**£57.50**



TRIO - YAESU - ICOM
FDK - KDK - DATONG - HUSTLER
SHURE - ASTATIC - Hy-GAIN
TELEX - MICROWAVE MODULES
HAL - DAVTREND - AVANTI and
EVERYTHING ELSE IN AMATEUR RADIO

Access

RADIO SHACK LTD

188 BROADHURST GARDENS,
LONDON NW6 3AY

(Just around the corner from West Hampstead Station on the Jubilee Line)

Giro Account No. 588 7151 Telephone 01-624 7174 Telex: 23718

BARCLAYCARD VISA

DATONG

TONE SQUELCH UNIT
MODEL PTS-1

Model PTS-1 is ideal for Raynet groups, club nets, or groups of friends who wish to monitor for each others signals over long periods.
Designed to wire-in to the microphone and loudspeaker lines of existing FM or AM transceivers, Model PTS-1 provides a second independent squelch system.
The squelch operates only when the incoming signal carries a prearranged tone of precisely the correct frequency. Thus two transceivers, each fitted with Model PTS-1, will respond only to each others transmission protecting the user from undesired interruptions.
Sixty-four tones in the range from 1747 to 2330 Hz are selectable by a DIL switch and a built-in notch filter removes the tone from received signals.

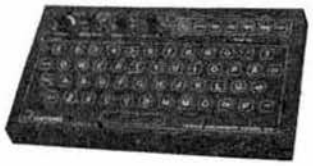
PTS-1 £39.99 with VAT £45.99

AUDIO FILTERS
MODELS FL2, FL3, FL2/A

Model FL3 represents the ultimate in audio filters for SSB and CW. Connected in series with the loudspeaker, it gives variable extra selectivity better than a whole bank of expensive crystal filters. In addition it contains an automatic notch filter which can remove a "tuner-upper" all by itself.
Model FL2 is exactly the same but without the auto-notch.
Any existing or new FL2 can be up-graded to an FL3 by adding Model FL2/A conversion kit, which is a Fully tested auto-notch module in P.C.B. Form.
Datong filters frequently allow continued copy when otherwise a QSO would have to be abandoned.

Prices: FL2 £78.00 with VAT £89.70, FL3 £112.50 with VAT £129.37, FL2/A £34.00 with VAT £39.67

MORSE KEYBOARD
MODEL MK



As well as looking terrific, Model MK brings some very useful features to enhance your CW operating. Its four 64-character memories allow auto-repeat and any number of programmed pauses per message.
It includes all normal characters (including accents) and the "merge" key lets you make up specials. The four colour key-board features individual click action switches beneath a tough wipe-clean surface and a buffer memory automatically converts indifferent typing to perfect morse.
All this, and it runs for up to a year from four internal pen cells (not supplied).

MODEL MK £119.50 with VAT £137.42

COMPACT RECEIVING ANTENNAS
MODELS AD270/370

MODEL AD370 HEAD UNIT

Datong Active Antennas solve the age-old problem of finding space for a 'good' receiving aerial.
Model AD370 mounted on a roof top or Model AD270 in a loft will give similar sensitivity to much larger conventional aerials yet are only 2½ and 3 metres long respectively.
Moreover they do not suffer from interference picked up by the feeder cable; such pick-up can be a problem with conventional dipoles because it is hard to maintain good balance over a band of frequencies.
Although active antennas were introduced to the amateur market by Datong only a few years ago they have long been used by military and commercial receiving stations. The performance specifications achieved by the Datong AD270/370 are very close to those of "professional" active antennas selling for ten times the price – a point which is not lost on our many professional customers.
The advanced design ensures two things: that you don't miss signals through inadequate sensitivity and that the antenna does not invent signals which are not there.
Datong Active Antennas represent an advanced solution to a common problem and so far as we know have no serious competition in terms of performance at the price. (Reviewed in Rad. Com., June 1982).

AD270 £41.00 with VAT £47.15 AD370 £56.00 with VAT £64.40

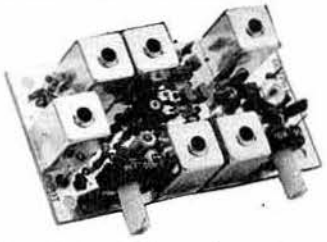
GENERAL COVERAGE RECEIVER CONVERTER MODEL PC1

MODEL PC1

Once upon a time it was the norm to use a ten metre receiver to receive the two metre band. Now, large numbers of special purpose two metre SSB rigs are in use and conversion the other way becomes a very attractive possibility.
With the addition of Model PC1 each of these two metre SSB rigs becomes a really good general coverage receiver (from 50 kHz to 30MHz!).
Two metre SSB rigs are not cheap and it makes good sense to get the most out of them. They also tend to have very good performance in terms of sensitivity, selectivity, and big signal handling. Each of these features is just as vital for short wave reception and Model PC1 is designed not to degrade them at all. The result, your two metre SSB rig receives below 30 MHz as well as it receives on two metres. And compared to many medium cost general coverage sets, that is saying a lot!
Try this test. Listen on twenty metres after the band goes dead in the evening. With many general coverage receivers the band never dies. It remains populated with phantoms generated by the receiver from the many very strong signals on forty metres. This is the kind of effect that the higher quality receivers minimise, and that goes for PC1 plus a good two metre rig. Reviews: Rad. Com., April 1982.

PC-1 £119.50 with VAT £137.42

HIGH PERFORMANCE 2 METRE CONVERTER
MODEL DC 144/28



Again strong signal performance is the key to the design of Model DC144/28.
Where conventional converters use a dual gate mosfet as a mixer, the Datong uses a balanced pair of Schottky diodes fed with nearly 10 mW of local oscillator at 116 MHz.
Where other converters use open wound coils, the Datong coils are in screening cans on a plated through board.
The result: an unusual freedom from spurious signals and overload effects together with a spurious-free dynamic range of 90 dbs.
As the Rad. Com. reviewer wrote "With a 3 db noise figure and 90 db dynamic range the Datong DC144/28 is one of the best 144 MHz converters currently available", Rad. Com., April 1982.
Model DC144/28 is available either as a tested PCB module, as illustrated, or fully cased in a diecast aluminium box.

DC 144/28 £34.50 with VAT £39.67

DATONG ELECTRONICS LIMITED

ALL DATONG PRODUCTS ARE DESIGNED AND BUILT IN THE U.K.

PRICES All prices include delivery in U.K. basic prices in £ are shown with VAT inclusive prices in brackets

FL3	112.50	(129.37)	AD370	56.00	(64.40)	Codecall		
FL2/A	34.00	(39.67)	AD270+MPU	45.00	(51.75)	(Linked)	28.00	(32.20)
FL1	69.00	(79.35)	AD370+MPU	60.00	(69.00)	Codecall		
FL2	78.00	(89.70)	MPU	6.00	(6.90)	(Switched)	29.50	(33.92)
PC1	119.50	(137.42)	DC144/28	34.50	(39.67)	Basic DF System	149.00	(171.35)
ASP	72.00	(82.80)	DC144/28			Basic Mobile		
VLF	26.00	(29.90)	Module	28.00	(32.20)	DF System	159.00	(182.85)
D70	49.00	(56.35)	Keyboard Morse			Complete Mobile DF		
D75	49.00	(56.35)	Sender	119.50	(137.42)	System	214.00	(246.10)
RFC/M	26.00	(29.90)	RFA	29.50	(33.92)	PTS1	39.99	(45.99)
AD270	41.00	(47.15)	See previous advertisement or price list for further details.					

Data sheets on any products available free on request – write to Dept RSGB

DATONG ELECTRONICS LIMITED

Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England. Tel: (0532) 552461

WOOD & DOUGLAS

We have moved! A new manufacturing facility is now available in Berkshire. The excellent service we already give will now be even better!

PROJECT	CODE	ASSEMBLED	KIT
70cms EQUIPMENT			
Transceiver Kits and Accessories			
FM Transmitter (0.5W)	70FM05T4	38.10	23.10
FM Receiver	70FM05R5	68.25	48.25
Synthesiser (2 pcb's)	70SY25B	84.95	60.25
Synthesiser Transmit Amp	A-X3U-06F	27.60	17.40
Synthesiser Modulator	MOD 1	8.10	4.75
Bandpass Filter	BPF 433	6.10	3.25
PIN RF Switch	PSI 433	9.10	7.75
Converter (2M or 10M i.f.)	70RX2/2	27.10	20.10
FM Package 2 (Synthesised)	70PAC2	163.00	128.00
TV Products			
Receive Converter (Ch 36)	TVUP2	26.95	19.60
Pattern Generator	TVPG1	39.95	32.53
TV Modulator	TVM1	8.10	5.30
3W Transmitter (boxed)	ATV-1	87.00	–
3W Transceiver (boxed)	ATV-2	119.00	–
Power Amplifiers (FM/CW Use)			
50mW to 500mW	70FM1	14.65	8.85
500mW to 3W	70FM3	19.65	13.25
500mW to 10W	70FM10	30.70	22.10
3W to 10W	70FM3/10	19.75	14.20
10W to 45W	70FM45	58.75	45.20
Combined Power Amp/Pre-Amp	70PA/FM10	48.70	34.65
Linears			
500mW to 3W	70LIN3/LT	25.75	18.60
3W to 10W (Compat. ATV1/2)	70LIN3/10E	39.10	28.95
Pre-Amplifiers			
Bipolar Miniature (13dB gain)	70PA2	7.90	5.95
MOSFET Miniature (14dB gain)	70PA3	8.25	6.80
RF Switched (30W Max)	70PA2/S	21.10	14.75
2M EQUIPMENT			
Transceiver Kits and Accessories			
FM Transmitter (1.5W)	144FM2T	36.40	22.25
FM Receiver	144FM2R	64.35	45.76
Synthesiser (2 pcb's)	144SY25B	78.25	59.95
Synth Multi/Amp (1.5W o/p)	SY2T	26.85	19.40
Bandpass Filter	BPF 144	6.10	3.25
PIN RF Switch	PSI 144	9.10	7.75
Synthesised FM Package (1.5W)	144PAC	138.00	105.00
Power Amplifiers/Linears			
1.5W to 10W FM (No Changeover)	144FM10A	18.95	13.95
1.5W to 10W FM (Auto-Changeover)	144FM10B	33.35	25.95
1.5W to 10W SSB/FM (O/P c/o)	144LIN10A	26.80	19.87
1.5W to 10W SSB/FM (Auto c/o)	144LIN10B	35.60	26.95
Pre-Amplifiers			
Low Noise, Miniature	144PA3	8.10	6.95
Low Noise, Improved Performance	144PA4	10.95	7.95
Low Noise, RF Switched	144PA4/S	18.95	14.40
SYNTHESISER ACCESSORIES			
Display Decoder/Driver	DISP1/2	22.60	16.10
GENERAL ACCESSORIES			
Toneburst	TB2	6.20	3.85
Piptone	PT3	6.90	3.95
Kaytone	PTK3	6.80	4.25
Relayed Kaytone	PTK4R	9.95	7.75
Regulator	REG1	6.80	4.25
Solid State Supply Switch	SSR1	5.80	3.60
Microphone Pre-Amplifier	MPA1	5.40	2.95
Reflectometer	SWR1	6.35	5.35
CW Filter	CWF1	6.40	4.75
TVI Filter (Boxed)	HPF1	5.95	–
MICROWAVE PROJECTS			
Microwave Drive Source	MD09T	29.50	20.40
Bandpass Filter	BPF 384	5.10	3.25
4M EQUIPMENT			
FM Transmitter (1.5W)	4FM2T	34.75	21.20
FM Receiver	4FM2R	61.65	43.15
Pre-Amplifier	4PA4	10.95	7.95
Pre-Amplifier, RF Switched	4PA4/S	18.95	14.40
6M EQUIPMENT			
Converter (2M)	6RX2	27.60	19.95

Enquiries by post should contain a SAE. Please restrict telephone technical enquiries between 6 pm and 9 pm in the evening on either 0256 24611 or 07356 5324. Access and Barclaycard orders can be taken on 07356 5324.

MAIN AGENTS: J. Birkett, LINCOLN 0522 20767
Darwen Electronics, LANCS 0254 771497
Amateur Radio Exchange, ACTON 01-992 5765
Wood & Douglas (Scandia) HM, SWEDEN 040 94 89 55

Prices include VAT at the current rate. Please add 75p postage and handling to the total order. ATV-1 and ATV-2 orders should include £2.00 for postage and insurance. Please allow 28 days for delivery if not stock at time of ordering.

UNIT 13, YOUNGS DEVELOPMENT, ALDERMASTON, READING RG7 4PQ

ROBOT '800' Super Terminal

THE PROFESSIONALS' CHOICE

"I never cease to be amazed at the ability of the Robot TU to copy RTTY signals that I could hardly discern by ear! Rapid QSB was the greatest enemy of perfect reception, otherwise it appeared as though little could deter the Robot from the assigned task of copying a desired incoming signal. On many occasions, very strong adjacent signals would literally "bury" the desired signal, but the Robot kept on printing to the screen as if nothing had changed."
(QST-April 1982)

RTTY/ASCII/CW/SSTV
£675 inc VAT & delivery
19p stamps for full details

AERO & GENERAL SUPPLIES

Building 33, East Midlands Airport, Castle Donington, Derby DE7 2SA. Tel: (0332) 812446

HIGH QUALITY CABLES FROM G8MWW

NEW H100 LOW LOSS COAX . . . better than UR67 . . . 80p per m (post 5p/m). 20% off 100m coil
UR43, 50 ohm, 20p per metre (3p/m)
UR76, 50 ohm stranded conductor, 20p per m (3p/m)
UR67, 50 ohm thick, low loss, 60p per m (5p/m)
UR95, Miniature Nylon 50 ohm, 25p per m (1p/m)
UR70, 75 ohm 5mm dia, 20p per m (3p/m)
LOW LOSS UHF TV FEEDER, 20p per m (3p/m)
75 ohm DOUBLE SCREENED 8mm dia COAX, 25p per m (4p/m)
300 ohm TWIN RIBBON FEEDER, 12p per m (2p/m). **75ohm** TWIN FEEDER, 18p per m (2p/m)
14 SWG HD COPPER AERIAL WIRE, 20p per m (2½p/m)
STRONG PVC COVERED AERIAL WIRE, 6p per m (2½p/m)
ALL UNIRADIO CABLES ARE TO BS2316
SAE for LISTS or Sample of any of above

All prices include VAT

W. H. Westlake, G8MWW, Clawton, Holsworthy, Devon

MODULAR ELECTRONICS 95 High St, Selsey, W. Sussex PO20 0QL. Selsey (0243) 602916
S.S.M. RF Power Transistors. Specialist RF components. Low noise Devices.
2N3866 **£1.01.** 2N4427 **£1.22.** 2N3553 **£1.34.** 2N5913 **£2.15.** 2N6080 **£5.97.** 2N6081 **£8.66.** 2N6082 **£9.49.** 2N6084 **£13.90.** 2N5590 **£7.65.** 2N5591 **£9.15.** 2N5944 **£7.47.** 2N5945 **£9.65.** 2N5946 **£12.25.** 2N5914 SD1127 **£2.80.** SD1143 **£8.85.** SD1416 **£36.48.** SD1135 **£7.49.** SD1136 **9.89.** SD1088 **£28.21.** SD1434 **£38.48.** SD1477 **£45.63.** SD Devices cover 4 to 100w out. Ex Equip RF 2N5070 **£2.88.** 2N5645 **£4.50.** Low noise Small Signal BFR90 **£2.82.** BFR91 **£3.45.** BFR34a **£2.25.** TP491 **£3.68.** 40673 **92p.** 3N204 **£1.75.** BF900 **£1.30.** BFY90 **£1.15.** BFT66 **£2.59.** SD201 **£2.45.** SD306 **£2.60.** 2N918 **60p.** 2N5179 **82p.** BF115 **50p.** BF180 **50p.** STZ110 = 2N2369/BSX20 **30p.** ZS276 1.5a 600v **12p.** 400v 2.5aBr **50p.** H.P. Diodes 5082 2800 **£1.10.** 2835 **98p.** PTFE Sheet 30 cm Sq **£2.45.** Trimmers. Tetfer 10pf **44p.** PTFE Film 9pf or 18pf **34p.** 25pf **15p.** BNC Plug **70p.** BNC S/H sock **69p.** 4h Sock **63p.** 600MHz-10 i.c. MC12013p **£11.50.** BF900 preamp (144) **£8.05.** BFR34a pre/a (432) **£8.62.** Ferrites FX1115 **6p.** FX1898 **13p.** FX2049 **12p.** Heatsink 6M1·6" **£2.50.** TBA120 I.F.I/C **82p.** Modules RF Amp with C/O. CPM2-15 1·5w = 15w **£28.75.** CPM2-25 3w = >20w **£29.95.** Send for details. RF amps 50 in/out no C/O. PM2-10 0·4w = 10w **£19.75.** PM2-15 1·5w = 15w **£21.75.** PM2-25 3w = 20w **£22.95.** RF Amps 50 in/out no C/O. PM70-10 1·7w = 10w (432) **£23.50.** PM70-4 0·4w = 4w **£21.80.**
All prices inc. VAT at 15%. Add 50p Post & Packing. Sae with enquiries, please.

(0632) 761002 **ALYN ELECTRONICS** (0632) 761002

APPROVED DEALER **ICOM®** **FULL RANGE IN STOCK**

Approved 'TONNA' stockist—Licensed credit brokers
— also —
Datong — Tasco — CDE — Daiwa — Hansen — TAL — Tono — G-whip HF antennas — Dummy Loads — Coaxial switches — plugs — sockets — cables

Access

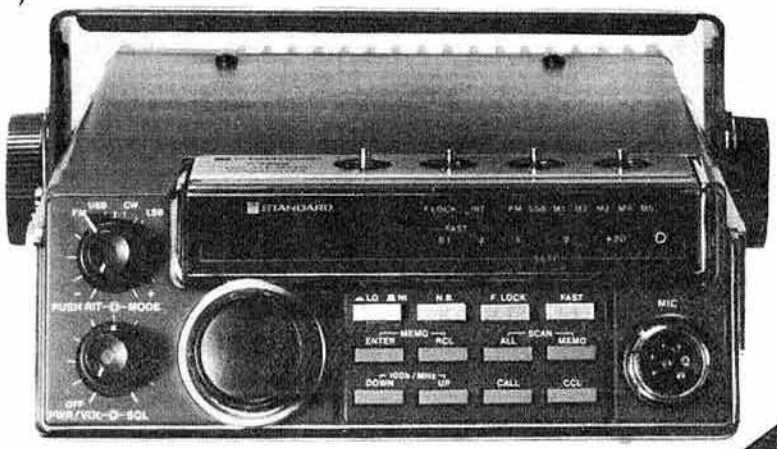
129 Chillingham Road
Newcastle-upon-Tyne
Open Tues-Sat 10am to 6pm

BARCLAYCARD VISA

For restricted space HF QTHs
a G2DYM UNI-POLE
will be your answer—Tx or SWL
Data Sheets, Large SAE. Aerial Guide 75p
G2DYM, UPLOWMAN, TIVERTON, DEVON
Callers Welcome Tel: 03986 215

Lee Electronics Ltd

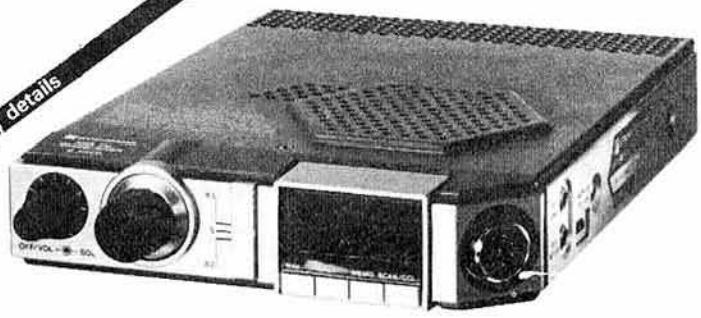
LEE LEE



* 144-146MHz
* 25W SSB/FM
* 10 Memories
* 3 Scan Modes
* USB/LSB/FM
* 25/5KHz Steps
* RIT Control
* S/Power Meter

C8900 (2 mtr)
C7900 (70cm)

C5800



s.a.e. for details

£359
(inc. VAT & carriage)

These small slim transceivers are ideal for todays compact cars as very little room is required for fitting. The units can be fitted separately or stacked one above the other with the brackets provided. Both units feature tiltable led displays for easy reading when the sets are mounted below the drivers eye level. The sets provide a good 10 watts RF output with excellent performance specification.

£219.00/£239.00 (inc. VAT)

INTEREST FREE H.P.

STANDARD C5800 Cash Price: £359	STANDARD C7900 Cash Price: £239	STANDARD C8900 Cash Price: £219	STANDARD C58 Cash Price: £245
H.P. over 6 months Deposit .....£72 Repayments ... £47.83 TOTAL £359	H.P. over 6 months Deposit .....£48 Repayments .....£31.83 TOTAL £239	H.P. over 6 months Deposit ..... £43.60 Repayments .....£29.23 TOTAL £218.98	H.P. over 6 months Deposit .....£50 Repayments .....£32.50 TOTAL £245
H.P. over 12 months Deposit .....£180 Repayments .....£14.91 TOTAL £359	H.P. over 12 months Deposit .....£120 Repayments .....£9.91 TOTAL £239	H.P. over 12 months Deposit ..... £109.50 Repayments .....£9.13 TOTAL £219.06	H.P. over 12 months Deposit .....£122.50 Repayments .....£10.21 TOTAL £245

400 EDGWARE ROAD,
LONDON W2
01-723 5521 Tlx 298765

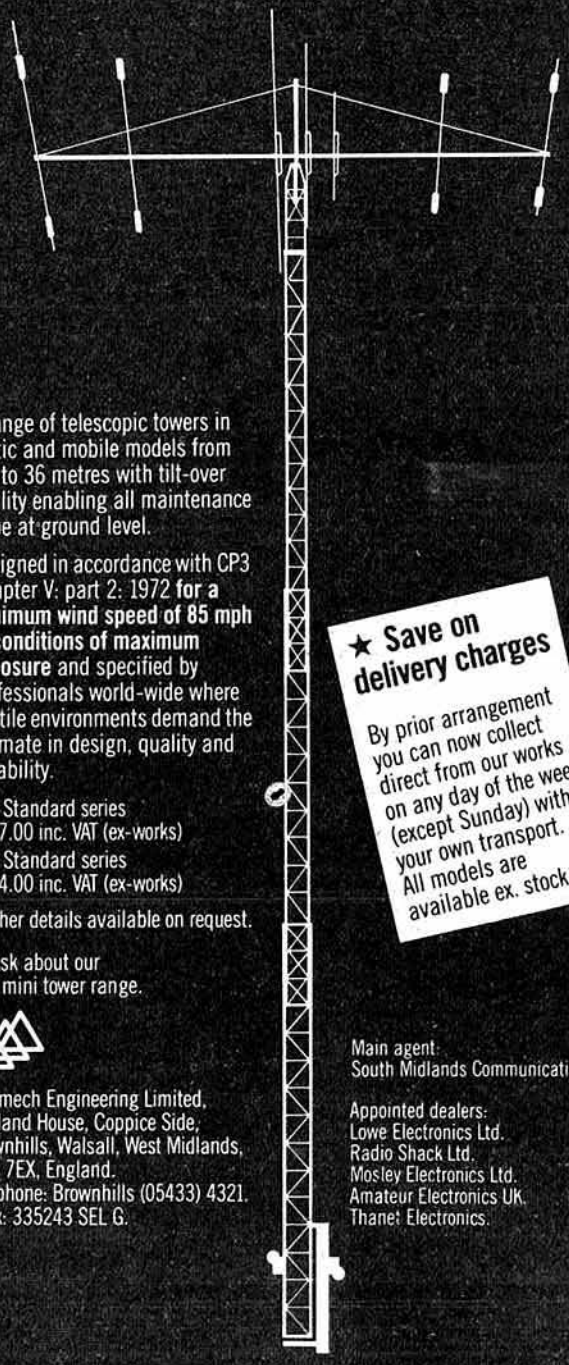
Please allow up to 14 days for delivery

Access Buy it with Access · BARCLAYCARD VISA

NEAREST TUBE:
EDGWARE ROAD
PADDINGTON

OPENING TIMES:
9.30am-5.30pm Mon, Tues, Wed, Fri.
9.30am-1pm Thurs.
10am-4.30pm Sat.

Versatower: The standard by which others are judged.



A range of telescopic towers in static and mobile models from 7.5 to 36 metres with tilt-over facility enabling all maintenance to be at ground level.

Designed in accordance with CP3 Chapter V: part 2: 1972 **for a minimum wind speed of 85 mph in conditions of maximum exposure** and specified by professionals world-wide where hostile environments demand the ultimate in design, quality and reliability.

P40 Standard series
£437.00 inc. VAT (ex-works)
P60 Standard series
£534.00 inc. VAT (ex-works)

Further details available on request.

★ Ask about our 9m. mini tower range.

★ Save on delivery charges

By prior arrangement you can now collect direct from our works on any day of the week (except Sunday) with your own transport. All models are available ex. stock.

Strumech Engineering Limited,
Portland House, Coppice Side,
Brownhills, Walsall, West Midlands,
WS8 7EX, England.
Telephone: Brownhills (05433) 4321.
Telex: 335243 SEL G.

Main agent:
South Midlands Communications Ltd.

Appointed dealers:
Lowe Electronics Ltd.
Radio Shack Ltd.
Mosley Electronics Ltd.
Amateur Electronics UK.
Thanet Electronics.

GWM RADIO LTD

All prices include VAT and post

CAMBRIDGE Boot Mid-band AM units only, **£13.** Accessories available **EX-NAVY** INTERNATIONAL WRIST WATCHES, **£20. EX-NAVY** polished brass case, bevelled glass, quality bulkhead CLOCKS. 8" dial, platform escapement, fully overhauled, **£85. AVO** Model 7 Mk 2 **TESTMETERS,** with Power Factor scale. Ex-Ministry, fully overhauled and with Jap test leads, no case, **£25. AMPLIVOX ASTROLITE** head and mike sets. Very comfortable. 600 ohms M/C mike and 600 ohms earpieces. **£7.50. OSCILLOSCOPES CT436,** 6MHz, Double Beam, **£65. MARINE RE-ENTRANT HORN** speakers, 4" mouth. Complete with line transformer, new and boxed, **£10. MAGNETA** 250v synchronous clock movements with time switch facility. Complete with set of short hands. Easily modified to suit almost any clock. Made about 1960 and in makers' boxes, **£2.25. EX-NAVY NAVIGATIONAL ROLLING RULES,** boxed, **£12** or polished, **£17. G.E.C. 602** 12v bootmount F.M. Highband, 6 channel. All solid state 25-30 watts R.F. Complete control box, speaker and mike, **£30. ISOLATING STEP-DOWN TRANSFORMERS.** 240v in, output tapped 100/115/120v in carrying case with handle, 500 watts capacity suit most small tools, **£20. POCKET DOSIMETERS,** simple rechargeable radio activity detector, 0-5 Roentgens. Sealed tube of **5 for £3.50.**

40-42 Portland Road, Worthing, BN11 1QN. Tel: 0903 34897

J. BIRKETT 25 THE STRAIT, LINCOLN. Tel: 20767

SPECIAL PURCHASE OF AIRSPACED VARIABLE CAPACITORS by Jackson, Wingrove etc. Limited Stock Brand New 15+15 p.f. @ **£1.40,** 150+100 p.f. @ **£1.30,** 208+176 p.f. @ **£1.40,** 250+150 p.f. @ **£1.15,** 350+150 p.f. @ **£1.30,** 300+300 p.f. Large B.C. Type @ **£1.50,** 400+400 p.f. @ **£1.50,** 500+500 p.f. Large B.C. Type @ **£1.60,** 300+300+300 Large B.C. Type @ **£2.30.** All with direct drive, 250+250+20+20 p.f. @ **£1.30,** 300+300+300 p.f. @ **£1.95,** 325+275 p.f. @ **95p,** 200+200 p.f. @ **£1.30,** 500+500 p.f. @ **£1.50,** 500+500+20+20 p.f. @ **£1.50** all with S.M. drive. **JACKSON 6 TO 1 FRICTION SLOW MOTION DRIVES @ 95p. JACKSON SOLID DILECTRIC 100 p.f. @ £1.15. PLESSEY SOLID DILECTRIC** 180+180 p.f. @ **5 for £1. CRYSTALS 10XAJ** 6MHz, 7025, 7085, 8065, 8082·35. 8089·89kHz all at **60p,** 10X 7010kHz @ **50p,** HC18 8005, 8006, 8014, 8016kHz all **£1** each. **TRANSISTORS** BSX19, BSX20, BSX21, BC548, BC549, BC558, ZTX108, ZTX213, ZTX342, ZTX450, 2N706, 2N5220, 2N2907A all at **6 for 50p. UHF RUBBER DUCK AERIALS** around 450MHz at **60p. MULLARD VHF POWER** 570 BLY, 40 watt, 28 volt, 175MHz with data **£6.50. MULLARD UHF POWER** BFR64 470MHz, 4 watt, 12-14 volt with data @ **£4. LEMCO TUBULAR CERAMICS** 1,000 p.f. 500VW @ **50 for 55p. X BAND GUNN DIODES** with data @ **£1.65. J BAND GUNN DIODES @ £1.65. MIXER DIODES L BAND** CS36A @ **40p,** CV165 @ **50p,** CV5022 @ **50p. S BAND** CV291 @ **40p,** CV364 @ **40p,** X BAND CS3B @ **40p,** CS3BR @ **75p.**

Please add 30p for post and packaging, Orders over £3 post free.

Special prices on surplus equipment

Eddystone Receivers770R(VHF) 770U(UHF) £135. 730/4 500KHz-30MHz in 5 bands £145. All in excellent condition. Carr £10.

Pye Bantams High band AM untested less xtal and batt. £22. With xtal and batt, tested £30. **Avo Valve Testers** £25. **Avo Multiminors** Tested and guaranteed £23. **New 28 Range Digital Multimeters** £40.25. **PCR Receivers LW/MW/SW with built in mains psu tested £45. Untested less psu £25. 12' Whip aerials** £4 p and p £1.50. **Advance E2 Signal Generators 100KHz-100MHz,**£40. p and p £3. **Taylor 67A Signal Generators 100KHz-240MHz.**£45 p and p £3. **Various** Single/double beam oscilloscopes, signal generators, valve testers, output meters etc **in stock.**

Surplus Circuits New book containing many circuits and notes on various surplus receivers transceivers etc £6.50. **Send 50p for fully illustrated catalogue** includes £1 voucher. Over 500 sets in stock. **Avos, amateur rigs WANTED FOR CASH.**

Weirmead Limited,129,StAlbans Road,Watford,Herts WD1 1RA
Telephone: Watford 49456 Access/Visa cards welcome.

ESSENTIAL FOR THE RADIO STATION WHICH CANNOT AFFORD EVERYTHING!

Individual hand made pottery tankard with your name and call sign (or XYL, Jnr Op etc.). Approximately ½ pint size **£2.50** each inc. VAT. P&P £1.40 each. Access and Visa welcome or c.w.o.

The Mobile Figures Company Ltd, Unit 7, Sawmill Industrial Estate, Alnwick. Tel: 0665 711005

AMATEUR EQUIPMENT IN THE SOUTH WEST

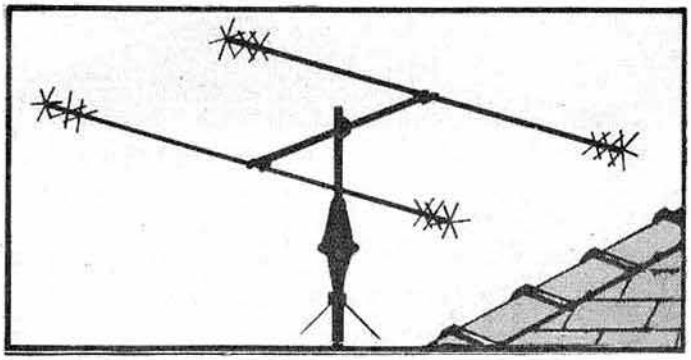
Full range of both Yaesu and Icom stocked

Ancillary equipment by Microwave Modules, Mutek, DRAE, Datong, SEM, Tokyo Hypower, Hansen, Himound, Packer, Tono, Tasco, and Shure. Aerials by Jaybeam, TET, Hy-Gain and G-Whip plus dummy loads, cables, plugs, valves.

INSTANT CREDIT AVAILABLE

REG WARD (G2BSW) & CO. LTD. AXMINSTER,
(REG G2BSW) DEVON EX13 5DP. 0297-33163. (RODNEY G6LUJ)

THE G4MH MINI BEAM



SMALL SIZE, HIGH PERFORMANCE

PACKAGE: Beam, rotator, 15m coax UR43, 15m 5 core £189.00
AERIAL ONLY: ..... £ 88.50
SELF ASSEMBLY KIT: Coils, spokes etc., ... £ 67.50
(Aluminium tube NOT included)
(Carriage UK mainland £2.50—kit £1.50)

SPECIFICATION:

Element length	11 feet	SWR at resonance	1·5 to 1:00 max
Boom length	60 inches	Power rating	1400 watts PEP
Turning radius	7 feet	Input impedance	50 ohms
Operating frequencies	10m, 15m, 20m	Wind resistance	80 mph
Forward gain (ref D pole = 1:00)	3·6 dB	Weight	14 lbs
		Rotator requirements	AR40

— UK AGENTS —
Amateur Electronics Ltd, Birmingham
Jaycee Electronics, Fife
Lowe Electronics Ltd, Matlock
Radio Shack Ltd, London
Stephens-James Ltd, Leigh, Lancs.
South Midlands Communications — (Southampton & all branches)

— OVERSEAS AGENTS —
EUROPE
Witronic,
Nanovestraat 153
1890 Opwijk, Belgium
USA/CANADA
AR Technical Products
PO Box 62,
Birmingham, Michigan 48012

- Large range of equipment in stock: Yaesu · Trio · Bearcat · S.E.M. · J. Beam · G. Whips · FT77 · FT480 · FRG7 · FRG7700 · FT230 · FT102 · FT290.
- Full range: SWR inds. coax, keys, books etc.
- Second hand equipment: Always large, ever changing stocks. S.A.E. for list. We buy second hand for cash.
- PX Welcome: We have Hi-Fi, Ham Radio, Computers and more.

Established 21 years with a knowledgeable staff to advise you. JIM G4MH, NORMAN G3WAH
Over 2,000 sq. ft. showroom area Open each day except Wednesday. Late night Thursdays till 8pm.

Amateur Radio Shop 4, CROSS CHURCH STREET, HUDDERSFIELD, W. YORKS.
TELEPHONE: HUDDERSFIELD (0484) 20774

OPTIVISOR
the most practical precision magnifier money can buy

Optivisor is the precision scientific/industrial binocular magnifier. It's lightweight, comfortable and can be worn over spectacles. When not in use, the visor tilts upwards.
The real bonus is that hands are left free, keeping accuracy and efficiency at a peak.
Optivisor comes with a choice of 6 readily interchangeable prismatic lenses, ground and polished to ophthalmic standards; magnification ranges from 1½ to 3½ times. An Optiloupe for either eye swivels easily into position giving 2½ times more magnification.

Magniray Optical Co
Carlton Park, Saxmundham, Suffolk IP17 2NL Tel: 0728 3506
A Charles Frank Company

Please send me full details and prices for Optivisor
Name_____
Address_____
RC1/83
Block Capitals Please
To: Magniray Optical Co, Carlton Park, Saxmundham IP17 2NL

L POOLE LOGIC ICOM® APPROVED DEALER

Comprehensive range of ICOM, YAESU, BREMI AND ZETAGI

ZETAGI B40 40 watts	(2M) £39.00
ZETAGI B100 100 watts	(2M) £72.00
BREMI 3 amp power supply	£11.90
BREMI 5 amp power supply	£16.40
BREMI 10 amp power supply	£40.50

POOLE LOGIC
49 Kingston Road, Poole, Dorset
Tel: (0202) 683093

FARNBOROUGH COMMUNICATIONS
97 OSBORNE ROAD, NORTH CAMP, FARNBOROUGH, HANTS
Price? Bargains

SOMMERKAMP*YAESU*FDK*ICOM

Stockist of Drae psu's, Jaybeam and Cue Dee Antennas, Microwave Modules, Oskerblock SWR, CDE, RSGB publications, quality cables, our own TVI filters, Welz, Bencher, Mirage amps.

Open Monday to Saturday 10am-6pm

ACCESS + H.P. Available + BARCLAYCARD

Telephone: Farnborough (0252) 518009

STEPHENS-JAMES LIMITED

G3MCN

TRIO TS-930S
HF TRANSCEIVER

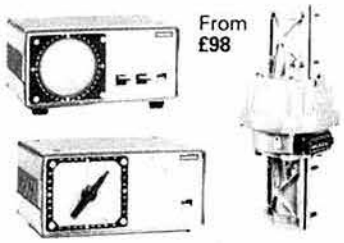
TRIO R-600
GEN. COV. RECEIVER

TRIO PRICES
Full Range of Accessories Available

TS830S	£697.82	R600	£257.60	TS130V	£456.32	TR2300	£152.00	TR8400	£299.00
AT230	£135.70	R820	£589.95	TL120	£167.67	TR2500	£232.53	TR9130	£433.22
SP230	£41.17	PS30	£101.66	SP120	£26.45	TR7730	£283.00	TR9500	£450.00
VFO230	£243.80	TS130S	£559.36	PS20	£57.96	TR7800	£257.60	TS930S	£1216.70
DFC30	£153.18			AT130	£93.15	TR7930	£305.21	TR7930	£305.00

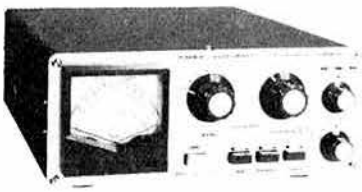
THE ONLY OFFICIAL STOCKIST OF TRIO EQUIPMENT IN THE NORTH WEST

DAIWA Full range of reliable antenna rotators



From £98

DAIWA AUTOMATIC ANTENNA TUNER



CN1001A 200 watt £156.00
CN2002 2kW £228.00

DRAKE

TR5 HF Transceiver/AC PSU	£745.00
MN2700 ATU	£253.00
MN75 ATU	£189.75
MN7 ATU	£125.50

Full range of Drake equipment available to order.

STABILISED POWER SUPPLIES

Model 125 10 15V 5A	£28.00
Model 156S 4 15V 6A Twin Meter	£40.00
Model 121OS 4 20V 10A Twin Meter	£75.00

Maximum ratings quoted.

STATION ACCESSORIES (inc post)

SWR 25 Twin meter	£12.80
2-way Antenna switch (V2)	£6.50
3-way Antenna switch (V3)	£10.80
4-way Antenna switch (V4)	£11.00
2-way Antenna switch (VHF)	£11.85
DL50 50 watt dummy load 50ohm	£7.00
DL50 Dummy load/wattmeter	£38.00
FX1 Station Wavemeter	£34.00
Welz SP200 swr/power	£59.95
Daiwa CN620A	£54.00

Full range of aluminium tubing, wall clamps, brackets "V" bolts for the caller.

TRANSCEIVERS AND RECEIVERS

AR22 Hand held 2m receiver	£83.00
FRG7700 Receiver	£329.00
SR9 2m FM Receiver	£46.00
FDK750E Transceiver	£289.00
FDK700AX Transceiver	£169.00

HY-GAIN ANTENNAS

12AVQ 10-15-20m Vertical	£50.60
14AVT/WB 10-15-20-40m Vertical	£64.40
18AVT/WB 10-15-20-40m-80 Vertical	£113.85
TH2 MK3 2 Element Tribander Beam	£169.05
TH3 JNR 3 Element Tribander Beam	£202.40
TH3 MK3 3 Element Tribander Beam	£274.85
TH6 DXX 6 Element Tribander Beam	£396.75
205BA 5 Element 20m Beam	£350.00
203BA 3 Element 20m Beam	£178.25
Mini Products HQ-1 Minibeam	£135.00
Mini Products C4A 10-15-20m Vertical	£55.00
GPV-5 2m Co-linear	£29.50
GPV-7 70cm Co-linear	£25.30
HF5 10-80m Vertical	£48.50
G4MH Mini Beam	£82.50
Hustler 5 band vertical	£86.75

The new TET range of VHF and HF antennas now available
Complete range of Jaybeam Yagi's Co-linear etc available
Complete range of G.WHIP Mobile Antenna's available

DATONG PRODUCTS

PCI Converter	£137.42
VLF Converter	£29.90
FL1 Audio Filter	£79.35
FL2 M mode Filter	£89.70
RF Speech Clipper	£82.80
D75 Man. Speech Clipper	£56.35
D70 Morse Tutor	£56.35
AD370 Active Antenna	£52.90
AD270 Active Antenna	£37.95

ICS and TONNA RANGE NOW in STOCK

FULL RANGE OF PUBLICATIONS IN STOCK RSGB, ARRL, ETC.

NRD-515 RECEIVER

For the discerning DXER comes the modern NRD-515 general coverage receiver ● Full of all performance advantages offered by any receiver ● All modes of operation PLL Digital VFO ● Solid state ● Up conversion type double conversion ● Frequency coverage 100kHz to 30MHz ● LF/MF bands below 1·6MHz are clearly receivable through the use of a filter/tuned circuit ● Band Pass tuning ● Noise Blanker ● RIR ● Attenuator ● AGC ● Recording terminal ● Mute terminal, etc which permits operation with the NSD-505 transmitter or ant transmitter ● Optional: speaker, memory unit, cw filter available.
PRICE **£985.00** inc VAT

JRC NSD515 Transmitter. Matching unit to the NRD515 Receiver available shortly. 65 years of experience produces the finest "seperates" available in the world to the Radio amateur who wants the best in Amateur Radio.

Shop Hours: Mon to Fri 9.30am to 5.30pm
Saturday 9.30am to 4.30pm ACCESS and Barclaycard facilities
HP terms arranged. Part exchanges always welcome
We are located on the A574. Turn at the Greyhound Motel on the A580 (East Lancs Road) and we are about ½-mile on right. No parking problems at any time. **SAE FOR S/H LIST.**

STEPHENS-JAMES
LIMITED
47 WARRINGTON ROAD
LEIGH WN7 3EA
ENGLAND
Telephone (0942) 676790

IQD

North Street, Crewkerne, Somerset, TA18 7AR
Tel: (0460) 74433 Telex: 46283 inface.g.

FREQUENCY STANDARD, MARKER & CONVERTER CRYSTALS
5·0, 10·0, 10·7 & 38·66667MHz 18U **£2.70**; 1·0MHz 6U or 33U **£2.95**; 100·0kHz 13U or 34U, 116·0MHz 18U **£3.00**; 455·0kHz 6U **£3.50**; 200·0kHz 6U **£3.70**; 1·0MHz hi-stab 6U **£4.25**; 10·0MHz hi-stab 36U **£6.00**

CRYSTAL FILTERS
Super selective 250Hz 8-pole CW filters for FT-101, FR-101, FT-301, TS-520, TS-820, FT-901 & FT-101Z **£18.69** each, and (9MHz types with appropriate carrier crystals):

9MHz SSB	6 pole, BW 2·5kHz at −6dB and 5kHz at −60dB	£20.50
9MHz SSB	8 pole, BW 2·4kHz at −6dB and 4·3kHz at −60dB	£24.00
9MHz CW	5 pole, BW 500Hz at −6dB and 2·2kHz at −60dB	£22.50
9MHz FM	8 pole, BW 12kHz at −6dB and 21·6kHz at −60dB	£24.00
10·7MHz FM	8 pole, BW 7·5kHz at −3dB and 17·5kHz at −70dB	£24.00
10·7MHz FM	8 pole, BW 15kHz at −3dB and 35kHz at −70dB	£24.00
21·4MHz FM	8 pole, BW 15kHz at −3dB and 50kHz at −80dB	£25.20

455kHz CFU series ceramic filters, various bandwidths in stock **£1.50**

TBG-2 crystal tone-burst generator **£8.00**

PLEASE ADD 15% VAT. POST FREE

ANTENNA FAULT?

LOSING DX? Poor reports? Check FAST with an Antenna Noise Bridge, MEASURE resonance 1-150MHz and radiation resistance 2-1000 ohms, 50 ohms mid-scale, get MORE DX, **£18.60.**

RARE DX UNDER QRM? DIG it OUT with a Tunable Audio Notch Filter, between your receiver and speaker, BOOST your DX/QRM ratio, 40dB notch, hear WEAK DX, **£16.40.**

LINEAR OKAY? Check with a Two Tone Oscillator **£13.90.**

MISSING DX? Make them HEAR YOU with a Speech Compressor, between your microphone and transmitter, BOOST your POWER up to four times, 60dB agc, SOUND BIG, **£15.30.**

Each fun-to-build kit includes all parts, printed circuit, case, instructions, by-return postage etc, money back assurance, GET yours NOW.

CAMBRIDGE KITS
45 (RR) Old School Lane, Milton, Cambridge.

B.N.O.S. ELECTRONICS

100 WATT 2 METRE LINEAR AMPLIFIER
V-J 100 PL **£107.00**

★ MOBILE MOUNT ★
★ 2 × PL259 PLUGS SUPPLIED ★
1-10 watts RF input, +80% overload protection, linear all mode operation, RF switched, FM and SSB delay switch, low noise MosFet Pre-amp, 12dB gain, Linear and Pre-amp independently switched, also straight through operation. Now manufactured in the UK by BNOS Electronics with full parts and service back up.

HIGH QUALITY NiCAD BATTERIES

	Type	1-9	10-24	25-99
'AA'	0·5Ah	0.90	0.85	0.82
'C'	2·2Ah	2.40	2.30	2.20
SUB 'D'	1·5Ah	2.30	2.15	2.00
'D'	4·0Ah	3.40	3.20	3.05
PP3	0·11Ah	4.25	4.00	3.80

NiCAD CHARGERS

AC.1	Charges up to 4 'AA' cells.	£5.90
MC.2	Charges up to 4 × 'AA', 'C' or 'D' cells or any combination of the above as well as PP3s.	£8.50
PC3	Charges 1 or 2 PP3 cells.	£7.40

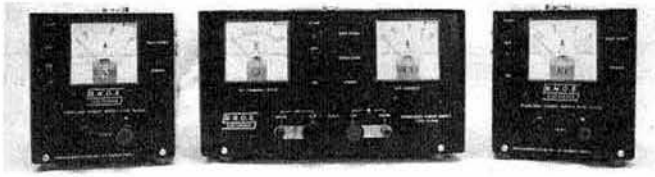
All battery prices include VAT, and FREE postage on orders over £5, for orders under £5 please add 60p to cover P&P.

BNOS 'A' SERIES POWER SUPPLIES

Primarily designed and ideally suited for both amateur and professional mobile transceivers. Now extending our range to meet a growing requirement the model 12/6A and 12/40A have been introduced.

The 'A' series of fixed voltage (13·8V) power supplies are designed to operate at full rated current continuously with voltage regulation better than 0·1%. Short circuit protection, foldback current limit and over voltage crowbar protection circuits are incorporated, along with full RF protection, to minimise equipment damage due to user error or equipment failure.

All of the 'A' series of power supplies incorporate output current meters, well rated output spade terminals (with integral 4mm socket on 6A and 12A models).



12/6A ★★NEW★★ **£48.30**
★ 13·8V, 6A continuous output
★ 7A maximum output current
★ 10A current meter
★ 10A output terminals
★ LED shut down indicator
★ Fully protected

12/12A **£86.40**
★ 13·8V, 12A continuous output
★ 15A maximum output current
★ Large 20A current meter
★ 15A output terminals
★ LED shut down indicator
★ Fully protected

12/40A ★★NEW★★ **£225.40**
★ 13·8V, 40A continuous output
★ 50A maximum output current
★ Large 50A current meter
★ Large output voltmeter
★ LED shut down indicator
★ LED out of regulation indicator
★ Output sensing terminals
★ Fully protected

12/25A **£125.45**
★ 13·8V, 25A continuous output
★ 30A maximum output current
★ Large 30A current meter
★ 30A output terminals
★ LED shut down indicator
★ Fully protected

BNOS Electronics, Dept RC, Greenarbour, Duton Hill
Gt Dunmow, Essex CM6 3PT. Tel: (037 184) 767
All prices inclusive of VAT: SAE for further details
POSTAGE FREE ON ALL MAINLAND UK ORDERS OVER £5, for orders under £5 please add 60p for P&P

BARCLAYCARD VISA

UHF CONNECTORS

PT. No.	TYPE	PRICE
Plugs		
BU 01	PL259 for Ø 0·4in cable (UR67)	0.47
BU 01A	Reducer for Ø 0·2in cable	0.12
BU 01B	Reducer for Ø 0·25in cable	0.12
BU 02	as BU 01 but with metric thread	0.56
BU 03	PL259 for Ø 0·2in cable	0.56
BU 04	PL259 push on connector	0.81
BU 05	PL259 elbow plug for Ø 0·2in cable	0.78
Sockets		
BU 11	SO259 square flange	0.40
BU 12	SO259 single hole, inside nut	0.47
BU 13	SO259 single hole, outside nut	0.47
Couplers		
BU 21	Back to back female	0.57
BU 22	Back to back male	0.79
BU 23	Male to female elbow	1.13
BU 24	1 male, 3 female 'T'	1.35
BU 25	3 female 'T'	1.46
BU 26	Female to female lightning arrestor	1.22
Adaptors		
BU 31	UHF plug to BNC plug	1.75
BU 32	UHF plug to BNC socket	1.15
BU 33	UHF socket to BNC plug	1.49
BU 34	UHF socket to BNC socket	1.64
BU 36	UHF plug to N socket	2.90
BU 37	UHF socket to N plug	2.90

DUMMY LOAD

BL 01	PL259 connector, 50 ohm impedance, 30W max, 15W continuous rating, DC-150 MHz, VSWR less than 1·2:1	6.78

PREAMP TRANSISTORS

3SK88	145MHz, 26dB gain, 1·1dB NF	1.05
BF981	145MHz, 18dB gain, 0·7dB NF	1.38
BFR91	432MHz, 18dB gain, 1·9dB NF	1.50

RF POWER TRANSISTORS

MRF260	145Mhz, 10dB gain, 5W output	6.56
MRF261	145Mhz, 6dB gain, 10W output	8.74
MRF262	145Mhz, 6.3dB gain, 15W output	14.40
MRF264	145Mhz, 5.2dB gain, 30W output	15.26
MRF221	145Mhz, 6.3dB gain, 15W output	17.60
MRF247	145Mhz, 7dB gain, 75W output	40.74

All figures for gain & output power are minimum values, full data supplied with all orders. Send SAE for free data on any of the above transistors.

UPPINGTON

G2BAR HAM BAND AERIALS

70 cms
7/FD 7 Element.....£11.20
11/FD 11 Element.....14.58

2 METRES
5/FD 5 Element.....11.78
8/FD 8 Element.....14.58
1/JP 'J' Pole.....11.78

PORTOMASTS
12ft 3 Guys.....14.00
18ft 6 Guys.....18.00

15 Metres
2 Element Array.....£46.50
3 Element Array.....61.00

HF BEAMS GAMMA MATCH
10 Metres
2 Element Array.....40.50
3 Element Array.....52.00

Inclusive VAT and postage. Roadline extra HF beams.

YAESU MUSEN STOCKISTS

HF and VHF range available and demonstrated.
Microwave Modules. Toyo and **Hansen** SWR meters.

TET AERIAL SYSTEMS—High Gain 2 metre HB9CV SWISS QUAD super multi-band systems for HF dual driven elements.
Send 30p in stamps for descriptive leaflets and prices.

12/14 PENNYWELL ROAD, BRISTOL BS5 0TJ
Telephone: Bristol (0272) 557732

VALVES VALVES VALVES

The following valves in matched pairs 6JS6/C, 6KD6, 6JB6/A, 6LQ6, 6HF5, 6146A, 6146B. **YES** the 6JS6/C is Japanese and works in the FT101. Most amateur radio valves including difficult to obtain types **EX STOCK**. Quotations without obligation. If we don't stock your type we may be able to import for you, PLEASE ENQUIRE. REMEMBER over 200 types **EX STOCK**. Sae for list. 'Phone for assistance re types suitable for your equipment. USA and Jap manufacture of popular types available.

DON'T DELAY 'PHONE TODAY 045 75 6114, G4AZM
Wilson, Peel Cottage, Lees Road, Mossley, Tameside, Manchester

AJH ELECTRONICS

20 Barby Lane, Hillmorton, Rugby, Warwickshire CV22 5QJ
Tel: Rugby (0788) 76473

144 MHz 80 WATT LINEAR AMPLIFIER designed by us for the FT290R or any Tcvr. having an output of 2½-3½ watts. suitable for SSB/FM power requirement is 13·8v @ 13 amps. straight through operation when switched off. Manufactured by us to professional standards finished in storm grey & matt black heat sink price only **£98.00**.
28-30 MHz RECEIVER PREAMP. Liven up that old Rx with one of these superboards many sold to date, uses dual-gate mosfet for super performance. Gain variable to 25dB, size 40 × 60mm ready built & tested **£8.00**.
NBFM ADAPTOR for the FT101 (up to 'E' model) provides FM on all bands, only one wire to solder to clarifier line, no holes to drill or PCBs to fit inside FT101, built in tone burst for use when used with VHF transverter. Still the best available **£70.00**.
MOTOROLA CAR CASSETTE PLAYERS model 401 & BL512 etc, warranty returns and needing repair, supplied with circuit only **£5.00**.
CRYSTAL FILTERS
STC LQU/445/909B 10·7 MHz ± 7½KHz BW @ 3dB. imp. 910 ohm. OK for FM, ex-equip. **£4.00**.
ITT024DE 10·7 MHz ± 3½KHz BW imp, 810 ohm, new only **£6·00**.
CATHODEON BP4133 10·7 MHz for SSB 1sb only, imp. 200 ohm new **£5·00**.
21·4 MHz ± 7½KHz BW @ 3dB OK FM, imp. approx 2k ohm. new **£4·00**.
TOYOCOM 6 MHz ±6KHz BW @ 3dB OK FM, imp 2k ohm ex-equip. **£3·00**.

BOLTIN FEEDTHROUGH CAPACITORS 2BA size thread, 1000pf 500vw brand new and made for us by famous manufacturer, **ONLY 40p** each.
Solder-in type 1000pf 500vw 3·2mm hole **50p per 10.**

3SK88 DUAL-GATE MOSFET ideal replacement for most 2mtr Tcvr front ends only 1·1dB noise figure 26dB gain, also OK for 70cms. PRICE REDUCED £1.00 **two for £1.75.**
3SK87 same as above but approx 3dB more gain. **£1·00** each.

TRIMMER CAPs, Airspaced 9mm sq. 15pf 20p ea. 30pf 35p. ea. solder in tubular ceramic 1-6pf **75p per 10.**
FILM TRIMMERS all 10mm dia. 25pf **10p** ea. 32pf 12p ea. 60pf (Dau) **20p** ea. 7mm sq 1-10pf **12p.**
CERAMIC COMPRESSION TYPE 10-40pf pc type **12p** ea. 10-80pf pc type OK 2mtr PA up to 40 watts **15p.**
LOW PROFILE RELAY OK for 2mtr AE switching will handle up to 75 watts 12v coil 2pco contacts **£3.00.**
10·7 MHz CRYSTAL HC18/U OK for FM detector IC etc. **£1.50.**
TDA1010 9 WATT AUDIO IC 9 pin sil. 12v with data **£1.75.**
TF144H/4S MARCONI SIGNAL GENERATOR (AM) 10Hz to 72MHz in 8 switched bands calibrated output 2μV to 2V into 50 ohms. modulation adjustable to 80%, internal crystal calibrator, in very good condition fully checked **£85.00** buyer to collect by arrangement.
TF1066B/1 SIGNAL GENERATOR AM/FM 10-480 MHz mint condition **P.O.A.**
TF801D/8S AM SIGNAL GENERATOR 10-480 MHz mint **P.O.A.**
S121 WAYNE KERR AUDIO GENERATOR 10Hz to 120KHz in 11 switched bands output 0-30 volts into 600 ohm. plus high imp. output, valve type mains operated, tested and in good condition with copy of manual **ONLY £30.00** buyer to collect by arrangement.
SEND FOR LATEST LIST OF COMPONENTS & TEST EQUIPMENT at give away prices.

Please add 60p for post and packing, all goods where possible are sent by return of post. Callers only by appointment please. All prices include VAT at 15%.

CLASSIFIED ADVERTISEMENTS

Classified advertisements **25p** per word, minimum **£4.00**
Box Number £2.00 extra to wordage or minimum.
Semi-display 1/8 page 2¼" × 3½" (57 × 91mm) **£76.00**
3/32 page 1⅛" × 3½" (42 × 91mm) **£59.00**
1/16 page 1" × 3½" (26 × 91mm) **£41.00**
Please write clearly. No responsibility accepted for errors.
Latest date for acceptance—7 weeks before 1st of issue month.
All classified and semi-display advertisements MUST be prepaid.

Copy and remittance to: **M. J. HAWKINS G3ZNI, RSGB Advertisements, PO Box 599, Cobham, Surrey KT11 2QE.**
(Cheques should be made payable to RSGB.)

Members' Ads must be sent to the editor at Chelmsford.

FOR SALE

QSL CARDS printed on white or coloured gloss cards. S.a.e to Caswell Press, 11 Barons Way, Woodhatch, Reigate, Surrey. Tel. Redhill 71023.
TVI/AFI? Cure it with ferrite rings, 67p each incl postage. TMP Electronics, Unit 27, Pinfold Workshops, Pinfold Lane, Buckley, Clwyd, CH7 9PL.
AERIAL WIRE 14swg hard drawn copper, 70' coils £5.50 140' £8.90 incl postage. TMP Electronics, Unit 27, Pinfold Workshops, Pinfold Lane, Buckley, Clwyd, CH7 9PL.
UNI-POLE TRAPPED AERIALS from G2DYM for restricted space QTHs. TXing & SWLing. Lists s.a.e. to G2DYM, Uplowman, Tiverton, Devon. Tel. 039 86 215.
FOR SALE/WANTED. G3RCQ Electronics. Amateur radio equipment bought, sold, exchanged. Hornchurch 55733 evenings 7-9 and weekends.
QSL & LISTENER CARDS. Quality printing on coloured and white gloss card at competitive prices. SAE for samples. S. M. Tatham, "Woodside", Orchard Way, Fontwell, Arundel, West Sussex.
AIRCRAFT COMMUNICATIONS HANDBOOK (UK/Europe) including spot mf, hf, vhf, uhf frequencies. Military and civil airports, air traffic control centres, long range stations, meteorological broadcasts, broadcast times, navigation beacons, co-ordinates, callsigns, maps etc. £7.50 (p/p £1.) PLH Electronics, 97 Broadway, Frome, Somerset BA11 3HD.
QSL CARDS. Quality printing on gloss or tinted cards. Sae for examples. Express Printing Services, 28 Payne Avenue, Hove, Sussex.
AERIAL WIRE Hard drawn copper 140ft 14SWG £6.90. 50 metres 16SWG £5.90, including postage. A. J. Steventon, 396 Chichester Road, Bognor Regis, West Sussex PO21 5DR.
PERSONALISED QSL CARDS, 1000 £13.75, 5000 £46.20. Sae for samples. Q/Cards, 89 Derwent Street, Blackhill, Consett DH8 8LT.
RIG ACCESSORIES. Over voltage crowbar module £4.75; PSU4 13·8V 4A regulated £19.95; PSU10 13.8V 10A regulated £45.83; 24/12V 48W convertor £10.75. All prices include p&p and VAT. Normally available from stock. Fremark Equipment, Strattons Walk, Melksham, Wilts SN12 6AL.
DIY QSLs. 100 mixed designs £1.90. 8 designs, coloured card. SAE samples. RWW, PO Box 11, Romsey, Hants SO5 8XX.
CREED TELEPRINTERS 444 (TP15) available to RAYNET members only, £36. Full details from Mike G8CPH, QTHR, Tel. Ipswich (0473) 831448 or your RAYNET controller. PAG terminal units also available.
RTTY PROGRAM FOR BBC microcomputer Model B. Split screen and type ahead while receiving. Pre-programmed memories. Auto tx/rx switching. CW ident. Many other features. Cassette and instructions £7.50. G3WHO, QTHR. Tel 078 981 377.
QSLs. For samples and price list, s.a.e. to Elm Tree Press, Polean, West Looe, Cornwall PL13 2DZ.
RUBBER STAMPS. Personalise your QSL. Special designs no problem. Handle and mount £2.20 (state size). Discounts for quantity. Two day service. Ring for quote. Stampreo Ltd, 42-44 Princes Road, Hull. (0482) 48134.
50m (165ft) AERIAL WIRE. Strong PVC covered copper only, £4.40 inc postage. W. H. Westlake, Clawton, Holsworthy, Devon.
LIST-A-RIG. The computer based selling service. Send large s.a.e. for free lists of used equipment. LIST-A-RIG, 65 Cecil Avenue, Hornchurch, Essex.
PROVEN ZX81 RTTY transceive programme and circuits with no alterations to the computer. S.a.e. for details to GM4CUZ, 15 Campfield Road, Broughty Ferry, Dundee DD5 2NG.
ZX-SPECTRUM MORSE TUTOR programs on cassette. £4.00 post paid. M. Gathergood, 80 Moorfield Road, Denham, Uxbridge, Middlesex UB9 5NF.
BBC MICRO SOFTWARE. RTTY Transceive £7.50, Morse Tutor £3.00, Morse TX Keyboard £3.00, QTH Locator £3.00, Multifile £6.00. Terminal Units also available; complete lists with order or s.a.e. Cheques payable R. C. Sterry, BLT Software, (Radcom), 1 Wavell Garth, Sandal Magna, Wakefield, West Yorks WF2 6JP.

NEW **SPIDERLIGHT** NEW

Rot proof ABS latticed masts and antennas. No metal parts except connectors on antennas.

Masts: up to 15ft. single stage **£182**; 20ft. two stage **£303**; 30ft. three stage **£385**; 40ft. four stage **£495**. All ready constructed, not kit

Antennas: VHF 14 element **£42**; UHF 24 element **£43**. Unique design allows horizontal, vertical or circular polarisation.

All masts will take standard types of antenna. Also black box mast and antenna service, we supply and erect, just plug in Tx/Rx. Ask for quote.

Prices inc. VAT at 15% and carriage, mainland only. C.W.O., Visa or Access. Just telephone anytime.

The Mobile Figures Co Ltd, Unit 7, Sawmill Industrial Estate, Alnwick. Tel: 0665 711005

QSL AND LISTENER CARDS printed on gloss and tinted card. S.a.e. for sample pack, T. Mann (Printer), 20 Oxenhope Road, Hull, HU6 7BZ.
TRS-80 ETC. SOFTWARE specially for radio amateur use. Sa.e. for details. Studio DeeJay, 7 Fitzwilliam Place, Billinghay, Lincoln LN4 4EU.
HEATHKIT SB100 TRANSCEIVER, SB600, SWR bridge, D104 mic, Diamond 10-80M trapped vertical. £250. Phone Griffin 0733 203169.
TS520S, VFO520, £425. TS280FMHP, £125. HF rotator, £70. KW500 linear, £95. EK121 autokeyer, £25. Also accessories. 0530 413973.
ICOM IN THE WEST plus most of your amateur requirements. See Thanet's advert. Open 9am-9pm Tuesday to Sunday inclusive. Up to £1000 instant H.P. Tel. Saltford (022 17) 2402. Booth Holdings Bath, 6 Golf Club Lane, Saltford, Bristol.
COLORSCAN 403. Convert your Robot 400 or SC77 for color SSTV. Complete kit with colorboard and interface unit assembled. Partial kits also available. Write to Martin G3OQD Agent for Sycel Communications Inc, 35 Hartfield Crescent, West Wickham, Kent BR4 9DW.
COMMODORE VIC20 RTTY and CW programs. No memory expansion required. Features memories which can be saved on tape and variable speeds. For further details contact G4MQW, QTHR. Tel. 021-745 4068.
ICOM IC701 AND POWER SUPPLY. One of the classic HF transceivers. Absolutely mint condition. Not used since recent check by importers. Also multiband matching transverter system as per SWM 1979 articles. G4FRX c/o RSGB Hq.
CALL SIGN LAPEL BADGES professionally engraved by return of post, £1.50 cash with order. (State name and callsign). Aylmer-Kelly (R), 2 Pickwick Road, Corsham, Wilts SN12 9BJ.
ALUMINIUM DIPOLES—4M 6M 10M, £7.95ea. 12M 15M 17M 20M, £9.95ea. Cables—RG58 19p/M, RG8 49p/M, 300ohm T.F. 12p/M. Connectors—PL259/6, 49p. PL259/9, 49p. SWR meters—5W HF, £5.95. 100W HF, £15.95. 10W 2M/70cm, £19.95. PSUs—13·8V 3/5A, £14.95; 5/7A, £16.95. Halbar Aerials. Barclaycard/Access. All prices include p&p and VAT. Electronic Facilities, 3 High Street, Sandy, Beds. (0767) 81494.

WANTED

EARLY TELEPHONE, TELEGRAPH and undersea cable items wanted. Derek Mortimer 01-722 4151.

AMATEUR RADIO INSURANCE SCHEME

"ALL RISKS" INSURANCE for portable/mobile/base station amateur radio and ancillary equipment. A service for RSGB members only. Also public liability and equipment insurance for affiliated clubs and societies. Details and leaflets from Nick Gibson, Amateur Radio Insurance Services Ltd, 19 Quarry Street, Guildford, Surrey. Tel: 0483 33771.

HOLIDAY ACCOMMODATION

CORNWALL, MARAZION. Country chalets near beaches. Ideal touring centre. Fully equipped throughout. G3UCQ, QTHR. (0736) 752982.
PEMBROKESHIRE—SOLVA. Enjoy your hobby on holiday. Luxury holiday homes on magnificent unspoilt coast. Near sandy beaches and secluded bays. Equipped and maintained to highest standards by resident owner. Colour TV, linen, fridge/freezer, central heating, washing machine, dryer. VHF and HF aerials available together with free use of HF and VHF equipment. For free colour brochure—M. J. Probert GW4HXO, Ynys Dawel, Solva Haverfordwest. Tel. 0437 721491.
WALES, DOVEY ESTUARY. Dorothy, Douglas offer dinner, bed, breakfast, shack. Good touring centre. GW4NMO GW4OBV, QTHR.
ENJOY THE BEST OF BOTH WORLDS at Fairmount House Hotel. You and your family will delight in excellent food with choice of menus, super bedrooms (some with private bathrooms) and quiet, sunny gardens. Dogs are welcome, too. Old-timer G6GR operates the Yaesu-equipped shack. Please write or telephone for brochure to Mr & Mrs Tolkien at Fairmount House Hotel, Herbert Road, Chelston, Torquay TQ2 6RW. Tel (0803) 605446.
CHESTERTON GUEST HOUSE, 2 Melvill Road, Falmouth, Cornwall. 0326 312760. Minutes from town, beaches. B & B £35.00. With E. meal, £56.00 per wk. G4OMD.
BOURNEMOUTH "DOLBADARN" PRIVATE HOTEL, 8 Grand Avenue, Southbourne BH6 3SU. Between sea and shops. Residential licence, bedroom radio, call and tea-making facilities. Excellent food. Dinner, bed and breakfast from £9.50 daily. Bed and breakfast from £6.50 daily. 0202 424826. E. W. & J. M. Batten (G3BKN).
SOUTH COTSWOLD VILLAGE. Detached bungalow. Comfortable, well equipped. Sleeps 4/5, central heating, garden, garage. G4EXF, QTHR. 045 382 2698.

MISCELLANEOUS

COURSES—RADIO AMATEURS EXAMINATION. City and Guilds. Pass this important examination and obtain your licence, with an RRC Home Study Course. For details of this and other courses (GCE, professional examinations, etc) write or phone—THE RAPID RESULTS COLLEGE, DEPT JT4, Tuition House, London SW19 4DS. Tel: 01-947 7272 (9 am-5 pm) or use our 24hr Recordacall Service: 02-946 1102, quoting Dept JT2.
PATENTS, TRADE MARKS and DESIGNS—Booklets on request. Kings Patent Agency Ltd. Established 1886 (B. T. King MIMechE, J. B. King, Regd. Patent Agents) —146a Queen Victoria Street, London EC4V 5AT. Tel. 01-248 6161. Telex 883805.

NEW! SAMSON ETM·8C MEMORY KEYER

8 MEMORIES, each stores approx. **50** Morse characters. Easy memory chaining for longer messages. Sends once only, or repeats till stopped. **KEYPAD** control of memories, repeat & tune functions. 8-50 wpm, self-completing, variable weighting. Usual superb fully-adjustable **BUILT-IN TWIN PADDLES** (for normal or squeeze keying). 4 AA batts. Keys tx by reed relay or transistor. Sidetone. New-style case. **ETM-8C, £124.95.**
SAMSON ETM-3C keyer, £66.86. **JUNKER PRECISION HAND KEY**, £41.65.
BAUER SINGLE-PADDLE KEY UNIT, £13.85.
All prices include 15% VAT & UK delivery. Please send stamp with all enquiries.

SPACEMARK LTD. THORNFIELD HOUSE, DELAMER ROAD, ALTRINCHAM, CHESHIRE (061-928 8458)

INDEX TO ADVERTISERS

Electronics Engineers

Communications

Marconi Space and Defence Systems, Military Communications Division, are rapidly expanding their Portsmouth operations. New buildings are being erected in response to important new contracts. Now additional experienced staff qualified to Degree/HND/HNC level are required to lead or operate within teams in the following areas:

- PV Crypto • Crypto • Advanced Systems
- Naval Systems • Baseband

The precise grades and experience required vary according to the individual project. The following skills, however, are particularly relevant:

- Analogue/digital hardware design
- Software development and preparation
- Software/hardware development and integration
- Design engineers for LSI based project
- Innovative digital design

Our salary scales match the high standards of qualifications, experience and ability demanded. We offer a comprehensive range of benefits together with relocation assistance if required.

Phone Portsmouth 674019 for further information and an application form. Alternatively, you can write to Jack Burnie, Marconi Space and Defence Systems Limited, Browns Lane, The Airport, Portsmouth, Hants., quoting ref: BL 21

(All posts open to men and women)

Marconi
Space & Defence Systems

Book Editor

The Radio Society of Great Britain requires a second book editor to work on new and existing publications in its expanding range.

Applicants should have at least two years' relevant book or magazine experience and a knowledge of radio and electronics. They should be able to assume responsibilities for all aspects of book production from manuscript to bound copies, while working under minimum supervision.

The position is a good opportunity to take up a creative and responsible role in a small but highly successful publishing house. It offers a competitive salary and excellent working conditions.

Please write with full CV to David Evans, General Manager, Radio Society of Great Britain, Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW, marking your envelope "Confidential".

MOBILE RADIO ENGINEERS
£8000 p.a. (including bonuses)

Top salaries for field and bench engineers with knowledge of U.H.F. and V.H.F. equipment. Job ability rather than formal qualifications preferred. This is an opportunity to join London's fastest growing independent, radio-telephone company based in modern premises near Regents Park. Ring 01-586 9851.

London Communications
(Equipment) Ltd
134 Gloucester Avenue, London NW1 8JA. Tel. 01-586 9851

EXPERIENCED SERVICE ENGINEER

Wanted to repair and service Amateur, Private Mobile and Marine equipment.

Previous experience is necessary.

Salary approximately £7,500 p.a. (negotiable)

Plus car for personal use

Apply to: **Communique, Communications House, Purley Avenue, London NW2. Tel: 01-450 9755**

RSGB MAIL-ORDER PRICE LIST

RSGB PUBLICATIONS

Books	Non-members' price	Members' price
A Guide to Amateur Radio (19th edn)	£3.44	£3.09
Amateur Radio Awards (2nd edn)	£3.41	£3.07
Amateur Radio Operating Manual (2nd edn)	£5.03	£4.53
Amateur Radio Techniques (7th edn)	£6.20	£5.58
HF Antennas for All Locations	£6.67	£6.00
Morse Code for Radio Amateurs	£1.31	£1.18
RSGB Amateur Radio Call Book (1983 edn)	£5.70	£5.13
Radio Amateurs' Examination Manual (10th edn)	£3.42	£3.08
Radio Communication Handbook (5th edn) Vol 2	£9.34	£8.41
Radio Communication Handbook (Vols 1 and 2 combined, paperback)	£11.15	£10.04
Teleprinter Handbook (2nd edn)	£13.84	£12.46
Television Interference Manual (2nd edn)	£1.95	£1.76
Test Equipment for the Radio Amateur (2nd edn)	£6.07	£5.46
VHF/UHF Manual (4th edn)	£10.31	£9.29
Logbooks		
Amateur Radio Logbook	£2.45	£2.21
Mobile Logbook	£1.14	£1.03
Receiving Station Logbook	£2.72	£2.45
Maps, charts and lists		
HF Awards List and Countries List	34p	31p
Great Circle DX Map (wall)	£2.12	£1.91
IARU Region 1 Beacon List	32p	29p
IARU QTH Locator Map of Europe (wall)	£1.37	£1.23
QTH Locator Map of Western Europe (wall)	£1.37	£1.23
QTH Locator Map of Europe (card for desk)	69p	62p
UK Beacon List	35p	32p
UK Repeater List	35p	32p
World Prefix Map in full colour (wall)	£2.23	£2.01
Miscellaneous		
"Amateur radio" (two colours) car sticker	63p	57p
DX Edge (HF propagation prediction aid)	£9.39	£8.45
"I'm on the air with amateur radio" (four colours) car sticker	84p	76p
"I'm monitoring ·5 are you?" (two colours) car sticker	68p	61p
QSL card holders	£1.14	£1.03
Radio Communication back issues *(As available)*	97p	87p
Radio Communication bound volume, 1980 (Parts 1 and 2)	£15.99	£14.39
Radio Communication bound volume, 1981	£15.99	£14.39
Radio Communication bound volume, 1982	£16.99	£15.29
Smith charts, pad of 25 (Chartwell D7510)	£2.35	£2.12
Members' sundries (members only)		
Radio Communication Easibinder	—	£4.24
RSGB badge car sticker	—	49p
RSGB belt (real leather)	—	£7.79
RSGB hf contest log sheets (100)	—	£2.10
RSGB teeshirt (medium, large, extra large)	—	£3.13
RSGB tie (coffee, maroon, green or blue)	—	£3.09
RSGB station callsign plaque*	—	£6.13
Standard callsign lapel badge*	—	£1.96
De-luxe callsign lapel badge*	—	£2.80
Lapel badge (RSGB emblem, pin fitting)	—	68p
Mini lapel badge (RSGB emblem, pin fitting)	—	68p
Members' headed notepaper (50 sheets) quarto	—	£1.00
Members' headed notepaper (50 sheets) octavo	—	68p

**Delivery approximately five weeks*

OTHER PUBLICATIONS

Title	Non-members' price	Members' price
ABC's of Capacitors (Sams)	£6.71	£6.04
ABC's of Integrated Circuits (Sams)	£4.79	£4.31
A Course in Radio Fundamentals (ARRL)	£3.24	£2.92
Active-filter Cookbook (Sams)	£12.71	£11.44
All About Cubical Quad Antennas (RPI)	£2.99	£2.69
Amateur Single Sideband (Ham Radio)	£4.60	£4.14
Amateur Television Handbook (BATC)	£2.39	£2.15
Amateur Television Handbook Vol 2 (BATC)	£2.39	£2.15
Antenna Anthology (ARRL)	£3.32	£2.99
ARRL Antenna Book (ARRL) (New edn)	£8.10	£7.29
ARRL Electronics Data Book (ARRL)	£3.60	£3.24
Beam Antenna Handbook (RPI)	£4.13	£3.72
Best of Oscar News (AMSAT-UK)	£1.64	£1.48
Better Short Wave Reception (RPI)	£3.42	£3.08
Beverage Antenna Handbook	£8.86	£7.97
Care and Feeding of Power Grid Tubes (Varian)	£2.98	£2.68
CMOS Cookbook (Sams) (Out of stock)		
Crash Course in Microcomputers (Sams)	£23.02	£20.72
Design of VMOS Circuits (Sams)	£8.50	£7.65
Electronic Design with Off-the-shelf ICs	£7.86	£7.07
Electronics for the Amateur (Sams)	£7.81	£7.03
English-French QSO Language Instruction	£1.78	£1.60
FET Principles, Experiments and Projects (Sams)	£8.04	£7.24
FM and Repeaters for the Radio Amateur (ARRL)	£3.72	£3.35
Hints and Kinks for the Radio Amateur (ARRL)	£3.13	£2.82
How to Program and Interface Your 6800	£12.80	£11.52
How to Troubleshoot and Repair AR Equipment	£7.13	£6.42
IC Converter Cookbook	£11.51	£10.36
IC Op-amp Cookbook (Sams) (Out of stock)		
IC Timer Cookbook (Sams)	£8.76	£7.88
Knowing Your Oscilloscope	£6.32	£5.69
Microcomputer Primer (Sams)	£13.98	£12.58
Newcomer's Guide to Simplex and Repeaters on 2m (UK FM Group)	£1.22	£1.10
Practical Antennas for the Radio Amateur (Scelbi)	£8.10	£7.29
Radio Amateur Callbook (1983 USA listings) (ARCI)	£17.15	£15.44
Radio Amateur Callbook (1983 DX listings) (ARCI)	£16.45	£14.81
Radio Amateurs Handbook 1983 (ARRL)	£9.85	£8.87
Radio Amateurs Handbook 1983 (ARRL) (Hardback)	£14.75	£13.28
Radio Frequency Interference (ARRL)	£2.69	£2.42
Radio Valve and Semiconductor Data Book (Newnes)	£4.44	£4.00
RTTY the Easy Way (BARTG)	£1.70	£1.53
Satellite Tracking Software for the Radio Amateur (AMSAT-UK)	£4.53	£4.08
SCRs and Related Thyristor Devices	£7.99	£7.19
Simple Low-cost Wire Antennas	£2.92	£2.63
Single Sideband for the Radio Amateur (ARRL)	£3.32	£2.99
Solid State Basics (ARRL)	£3.93	£3.54
Solid State Design for the Radio Amateur (ARRL)	£5.64	£5.08
Son of Cheap Video	£7.12	£6.41
The Cheap Video Cookbook (Sams)	£5.47	£4.92
The 8080A Bugbook (Sams)	£9.59	£8.63
Troubleshooting with Your Oscilloscope	£7.05	£6.35
TTL Cookbook (Sams)	£8.55	£7.70
TV Typewriter Cookbook (Sams)	£8.70	£7.83
Understanding Amateur Radio (ARRL)	£4.14	£3.73
World Atlas (RACI)	£1.91	£1.72
World Radio TV Handbook 1983	£12.15	£10.93
ZAPP—Impedance and Power Potential	£4.17	£3.75
6801, 68701, 6803 Microcomputer Programming	£11.28	£10.15
6809 Microcomputer Programming	£10.89	£9.80
80 Meter DXing (CTI)	£3.12	£2.81
8085A Cookbook	£11.34	£10.21

ORDERING INFORMATION

NON-MEMBERS. Use left-hand price columns. Note that members' sundries are only available to members of RSGB.

MEMBERS. Use right-hand price columns. Enclose with the order a recent *Radio Communication* address label as proof of membership.

PRICES. These include postage, packing and VAT where applicable. For airmail despatch, please ask for price before ordering. Goods are obtainable, less p & p, at RSGB headquarters between 10am and 4pm, Monday to Friday.

POSTAL TERMS. Cash with order. Stamps and book tokens cannot be accepted. Cheques and postal orders should be crossed and made payable to "Radio Society of Great Britain". Giro cheques only can be accepted, as payment for orders *must* accompany the order itself. Please write your name and address clearly on the order, and allow up to 28 days for delivery.

ORDER FROM

RSGB Publications (Sales),

Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW

(Raynet supplies should be obtained from Mrs J. Balestrini, Merrivale, Willow Walk, Culverstone, Gravesend, Kent)

MORSE INSTRUCTION AIDS

G3HSC rhythm method of morse tuition

Complete course (Two 3-speed lp records and one ep, plus books).	£6.99	£6.29

On all overseas orders for G3HSC course, including orders from Eire, add £1.12 for additional packing and postage from supplier

MAGAZINE SUBSCRIPTIONS

QST (including ARRL membership). One year	£18.30	£16.47
Two years	£35.30	£31.77
Three years	£51.30	£46.17
By air via KLM (to W Europe only) one year	£24.55	£22.10

Send *QST* subscriptions to RSGB, Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW.

Ham Radio Magazine (per annum) (incl air delivery) . . £14.00

Subscriptions and changes of address for *Ham Radio Magazine* should be sent to: Ham Radio Magazine (UK), PO Box 63, Harrow, Middx HA3 6HS.

ARROW

... Give us a ring
Tel: 0277-226470 or 219435

7 Coptfold Road, Brentwood, Essex CM14 4BN
Tel: 0277 226470 or 219435 Ansafone on 219435 Telex: 995801 (REF: A5)

YAESU

FT 77	New model	£499.00
FT 675	New model	P.O.A.
FT 980	New model	P.O.A.
FT 730	New model	269.00
FC 102	ATU	209.00
SP 102	Speaker	65.00
FT 102	160-10M 9-Band Transceiver	785.00
FT ONE	Gen. Coverage Transceiver	1349.00
FT 790R	70cm all-mode portable	325.00
FT 101ZDFM	160-10m 9-Band Transceiver	665.00
DCT 101Z	DC Adaptor	42.50
FV 101Z	Remote vfo	112.00
FV 101DM		235.00
FT 902DM	9-Band AM/FM Transceiver	885.00
FC 902	9-Band atu, swr/pwr etc	135.00
FTV 901R	Transverter fitted 2m module	285.00
430 TV	70cm module for above	185.00
144 TV	2m module for Transverter	100.00
70 TV	4m module for Transverter	80.00
FV 901DM	Remote vfo for 901	260.00
SP 901	External speaker	31.00
FL 2100Z	9-Band 1200W linear	445.00
FRG 7	0·5-30MHz receiver	189.00
FRG 7700	SSB/AM/FM recvr.	335.00
MEM 7700	Memory unit for above	89.00
FRV 7700A	118-150MHz Converter	69.75
FRV 7700B	50-60MHz & 118-150MHz	75.50
FRV 7700C	140-170MHz	65.95
FRV 7700D	70-80MHz & 118-150MHz	72.45
FRV 7700E	140-160MHz & 118-130MHz	71.30
FRV 7700F	150-160MHz, 118-130MHz & 170-180MHz	71.30
FRT 7700	Receiver aerial tuner	37.85
FT 480R	2m all-mode transceiver	365.00
FP 80A	230V AC power supply	63.00
FT 780R	70cm all-mode UK rpt. shift.	399.00
FT 290R	2m all-mode portable	265.00
NC 11C	AC charger	8.00
MMB-11	Mobile mounting bracket	22.25
FT 208R	2m synthesized portable FM	199.00
NC 9C	AC charger	8.00
FT 708R	70cm hand-held	209.00
FT 230R	2m FM mobile	239.00

All Yaesu accessories available—mostly ex stock.

TRIO-KENWOOD

TR 7930	2m XCVR	NEW	P.O.A.
R 2000	Receiver		395.00
TR 3500	70cm Handy		250.00
TS 930	Gen. coverage transceiver		1219.00
TS 530S	160-10m trans 200w pep digital		P.O.A.
TR 2500	2m FM synthesised handheld		232.00
DM 801	Dip meter		71.30
R 600	Gen. coverage receiver		257.00

All Trio-Kenwood accessories available.

SOMMERKAMP

TS 280FM	2m Mobile 50W FM	189.00

ROTATORS

KR 250	Kenpro Lightweight 1-1½" mast	55.00
KR 400RC	Kenpro—inc. lower clamps	115.00
KR 600RC	Kenpro—inc. lower clamps	163.00

ICOM

IC 740	Multimode H. F. transceiver		725.00
IC 720A	HF transceiver and gen. cov. rec.		949.00
ICR 70	Multimode receiver	NEW	499.00
PS 15	Power supply for 720A		119.00
IC 251E	2m multimode base station		559.00
IC 290H	2m multimode mobile	NEW	399.00
IC 2E	2m FM synthesised handheld		169.00
IC 4E	70cm handheld		199.00
ICL1/2/3	Soft cases		3.50
IC HM9	Speaker/microphone		15.00
IC CP1	Car charging lead		4.49
IC BP2	6V Nicad pack for IC 2E		33.00
IC BP3	9V Nicad pack for IC 2E		23.00
IC BP4	Empty case for 6 X AA Nicads		6.95
IC BPS	11·5V Nicad pack for IC 2E		44.00
IC DC1	12V adaptor pack for IC 2E		11.99

TRIO

CI 303G	Communication scope	196.65
PF 810	Power/SWR meter	97.75

Catalogue of Trio instruments send SAE.

TONNA

20117	2m 17 element	39.90
20505	50MHz 5 ele.	34.90
20104	2m 4 ele.	14.25
20109	2m 9 ele.	15.44
20209	2m 9 el. port	17.46
20118	2m 2 × 9 el. cross	28.51
20113	2m 13 el. port	27.20
20419	70cm 19 el.	19.90
20438	70cm 2 × 9 el. cross	30.05
20421	70cm 21 el.	26.00
20422	21 el. ATV	30.05
20199	2m + 70 Oscar	30.05

Full range of Tonna accessories stocked.

G-WHIP MOBILE ANTENNA RANGE

Tribander helical for 10/15/20 metres	25.80
Base mount single hole fixing + 3m cable	6.30
LF 40m coil for above aerial	6.55
LF 80m coil for above aerial	6.55
LF 160m coil for above aerial	6.55
LF telescopic resonator whip	4.25

We also stock flexiwhip & multimobile G-whips.

WELZ

SP 10X	Mini meter 1-8-160MHz 200W	24.00
SP 15M	1-8-150MHz 2-5W-20W-200W	35.00
SP 45M	2m/70cm 100W	49.00
SP 200	1-8-160MHz 20W-200W-1kW	73.00
SP 300	1-8-500MHz 20W-200W-1kW	99.75
SP 350	1-8-500MHz 200W	55.00
SP 400	130-500MHz 5W-20W-150W	72.25
SP 250	1·6-60MHz 2kW	49.30
SP 380	1-8-500MHz 20W-200W	61.30
AC 38M	8 band ATU	64.90
CH 20A	<450MHz coax switch	17.50
CT 150	150/400W D/load	35.00
CT 300	300/1kW-250MHz D/load	53.80

TONO

THETA 9000E	RTTY/CWASC11	650.00
THETA 550	The latest—a winner!	299.00

TASCO

TeleReader CWR 685 RTTY/CW/ASC11	699.00
TeleReader CWR 670E As above RX only	259.00
MorseMaster CWR 600 As above basic unit	189.00

ADONIS MICROPHONES

MM 202S	Safety mic. Lapel type	20.95
MM 202HD	Safety mic. head band	29.00
MM 202HM	Headphone & mic.	39.00

ALINCO

AL 230	2m 30W Linear 1-3W in FT 290R etc	39.00
AL 710	70cm 10W Linear	65.00
AL 730	70cm 30W Linear	79.00

SAGANT

MT 240X	HF 80-10m Wire array	49.50
MTE 40X	80m + 40m array	45.00
BL 40X	1:1 Balun SO 239	12.65

FRITZELL

FD 4	Windom Array HF bands	31.50
FB 16	1:6 Balun for DIY	17.45

Send for details NEW RANGE.

HALBAR

LIN 5	70cm 5 el. Yagi	7.99
STR 5	2m 5 el. Yagi	9.99
FOLDI	2m 5 el. Foldup	13.00
TWIN	2m Vert.	14.95
TWIN 70	70cm Vertical	7.99
DIP 2	2m Dipole	3.95
HALO	2m Halo	5.50
LPA	Log-periodic 70cm	15.00
QUAD 6	2m 6 el. Quad	25.00
QUAD 4	2m 4 el. Quad	17.50

DAIWA

DR 7500R	up to 3 el. HF beam round controller		125.00
DR 7600X	Heavy duty w. preset cont.		P.O.A.
DR 7600R	as above round cont.		P.O.A.
KSO 65	Stay bearing		18.50
CS 201	2-way switch 0-500MHz		14.00
CS 201N	above w. N sockets		21.00
CS 401	4-way w. SO 239		43.00
RM 940	Infra Red mic.		P.O.A.
CN 520	1-8-60MHz SWR/PWR		40.60
CN 540	50-150MHz SWR/PWR		35.00
RX 110G	2m GaS Fet Preamp	NEW	39.00
RX 430G	70cm GaS Fet Preamp	NEW	63.00
RF 670	RF Speech Proc.	NEW	44.00
FD 30LS	Low pass Filter		13.50
FD 30M	LP Filter HD		21.50

MISCELLANEOUS

CANTENNA Dummy Load	14.95
ARROW 15Amp PSU with meter	86.00
COAX SEAL for sealing antennas etc against weather	20p foot
SWEDISH KEY Brass on Teak beautiful straight key	P.O.A.
VIBROPLEX various types in stock 64MHz minibeam	80.00
Microwave Modules stocked.	
KENPRO KP 100 Keyer	79.00

TET

HB 33SP	3 el. Tri-Bander HF Beam	189.00
MV 3BH	Tri-Band vertical	40.25
MV 5BH	5 Band Vertical	71.25
SQ YO 8	8 el. Quagi 2m	48.96

CARRIAGE & VAT:
ALL PRICES INCLUDE VAT, ITEMS OVER £50.00 VALUE OR TOTAL ORDERS OVER £50.00 ARE CARRIAGE FREE. SECURICOR (OUR OPTION) FOR MAJOR ITEMS. ALL DESPATCHES ARE INSURED BY US—NO RISKS TO YOU IF LOST OR DAMAGED.

GIVE US A RING!

"PHONE YOUR ORDER FOR TODAY'S DESPATCH ALL WE NEED IS YOUR [ACCESS] OR [BARCLAYCARD VISA] NUMBER, SMALL SPARES — PLUGS — AERIALS — PHONE FOR A QUOTE FOR THAT NEW RIG!"

OPEN 5 DAYS A WEEK. CLOSED THURSDAYS

YAESU MUSEN

FT-790R
FT-290R
(+FT690R, 6 metres)
MULTIMODE
MULTI-ROLE
VHF/UHF TRANSCEIVERS

MULTIMODE OPERATION
Never before possible from such a compact package, true multimode —USB, LSB, CW & FM—operation is yours to enjoy. With CW and SSB activity at an all-time high, you will not be left out of the satellite or DX action and you can still ragchew on FM simplex or even via a repeater (inbuilt shift and 1750Hz tone burst).

ADVANCED MICRO CONTROL
Advances in microprocessor circuitry allows selectable synthesizer steps, up/down scanning from the microphone, priority channel operation, and ten memories (with memory scan), all called up with fingertip ease.

LCD DISPLAY
A large, newly developed Liquid Crystal Display provides readout of the operating frequency, and an indication of a number of the control functions. It is highly readable under conditions of bright sunlight and is backed up by a lamp for night-time operation.

PROGRAMMABLE SYNTHESIZER
The optimum synthesizer steps for SSB/CW or FM operation are very different. That's why Yaesu gives you the flexibility of two synthesizer steps per mode: 100Hz or 1kHz per step on SSB and CW, and 12½/25kHz (2m), 25/100kHz (70cm). When changing modes from SSB/CW to FM, your transceiver is automatically set to the nearest standard channel when you start scanning or tuning.

TEN MEMORY CHANNELS
As many as ten frequencies may be stored into memory, for instant recall. The priority feature allows you to check a favourite frequency every few seconds, with automatic halting (FM mode) when the channel is clear or busy, as desired. Memory backup is provided by a built-in lithium cell, with an estimated lifetime of five years.

DUAL VFO SYSTEM
These transceivers feature a digitally synthesized dual VFO system which provides tremendous flexibility in day to day operation. For example, one VFO may be set up in the SSB portion of the band, and the other in the FM sub-band, for immediate QSY when changing modes.

CONVENIENT FEATURES
Among the many features adding to the convenience of the transceiver is a supplied portable antenna, a high-performance noise blanker, a high/low power switch, and a battery condition meter. A clarifier (offset tuning) allows you to follow unstable or Doppler-shifted signals.

FT690R
In addition to the two metre and 70 centimetre units detailed here, the FT690R six metre (50-54MHz) transceiver completes *for the time being*, the range. The general specifications are similar but modes are USB-CW-AM-FM, power is 2½W PEP [0.8W AM—for which a 4kHz filter is fitted]. Further details on request.

GENERAL FEATURES

Modes of operation:
SSB (USB, LSB) CW & FM

Frequency response:
300-2,700Hz @ −6dB

Carrier Suppression:
Better than −40dB

Sideband Suppression:
Better than −40dB

FM Deviation:
±5kHz (max)

Tone burst frequency:
1,750Hz

Selectivity:
SSB/CW: 2.4kHz @ −6dB
4.1kHz @ −60dB
FM : 14 kHz @ −6dB
25 kHz @ −60dB

Image rejection:
Better than −60dB

Audio output:
1 Watt @ 10% THD

Audio output impedance:
8 Ohms

Dimensions:
58H × 150W × 195D mm
1.3kg (without cells)

Power requirements:
8 × C size dry cells
8 × C size Nicad cells
External 8.5-15.2VDC
Memory backup: Lithium cell

Microphone:(YM47 supplied)
600 ohms ppt with scan

ACCESSORIES

YM49
Remote speaker mic

YM50
DTMF keyboard mic

MMB11
Mobile mounting bracket

FL2010
2 metre 10W amplifier

FL7010
70cms 10W amplifier

CSC1A
Vinyl carrying case

NC11C
Battery charger

FLC11
H.D. Leather case

YHA15
Helical antenna (FT290R)

FT-290R

Frequency coverage (MHz):
144-146 or 144-148

Synthesizer steps:
SSB/CW: 100Hz/1kHz
FM : 12.5/25kHz

Current consumption:
70mA receive
800mA Tx (2.5 W RF FM)

Antenna:
SO239 on rear
Telescopic ¼ Wave supplied

RECEIVER

Intermediate frequencies:
1st IF 10.81MHz
2nd IF 455kHz (FM)

Sensitivity (better than):
SSB/CW: 0.5μV for 20dB S/N
FM : 0.25μV for 12dB SINAD

TRANSMITTER

Power Output:
2.5 Watts at 12VDC

Spurious radiation:
Better than −60dB

Repeater split:
600kHz (+ and −)

FT-790R

Frequency coverage:
430-440MHz

Synthesizer steps:
SSB/CW: 100Hz/kHz
FM : 25/100kHz

Current consumption:
100mA receive
750mA Tx (1W RF FM)

Antenna:
BNC on top panel
½ Wave flexi supplied

RECEIVER

Intermediate frequencies:
1st IF 67.3MHz
2nd IF 10.7MHz
3rd IF 455kHz (FM)

Sensitivity (better than):
SSB/CW: 0.16μV for 10dB S/N
FM : 0.25μV for 12dB SINAD

TRANSMITTER

Power Output:
1 Watt at 12VDC

Spurious radiation:
Better than −50dB

Repeater split:
1.6MHz (input listen)

SOUTH MIDLANDS COMMUNICATIONS LTD
SM HOUSE, RUMBRIDGE ST
TOTTON, SOUTHAMPTON SO4 4DP

SMC

YAESU MUSEN'S ONLY AUTHORISED UK AGENTS

G3FIK

AMATEUR ELECTRONICS UK
504-516 ALUM ROCK ROAD
ALUM ROCK,
BIRMINGHAM 8

Printed in Great Britain for the RADIO SOCIETY OF GREAT BRITAIN, Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW
by E T Heron & Co Ltd, Silver End, Witham, Essex